

330/345

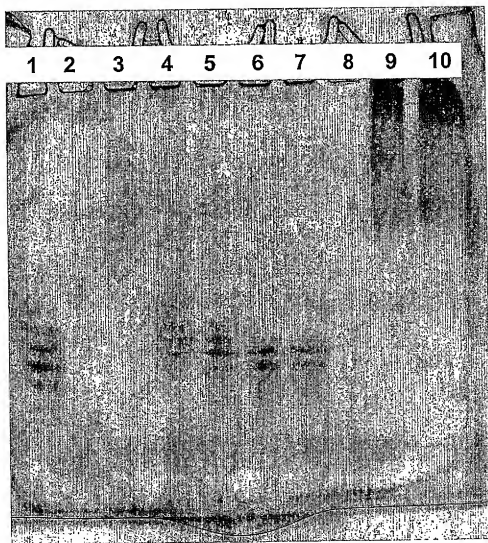


FIG. 111

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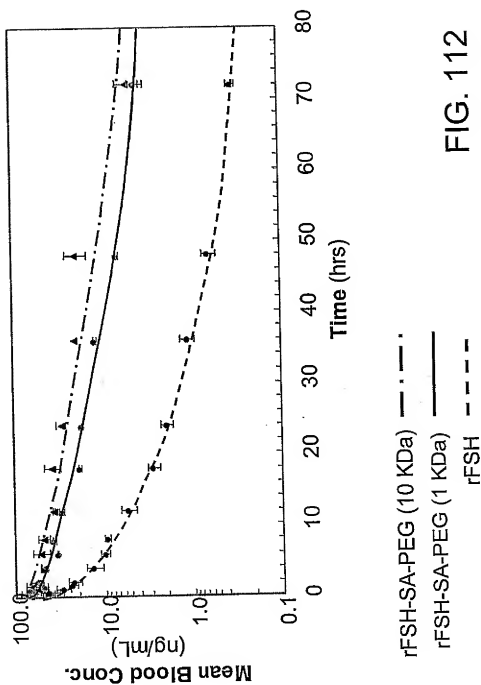


FIG. 112

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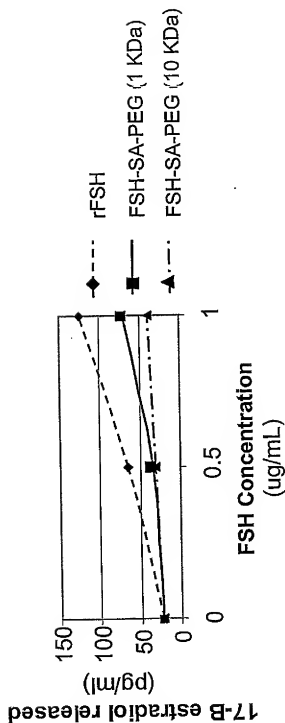


FIG. 113

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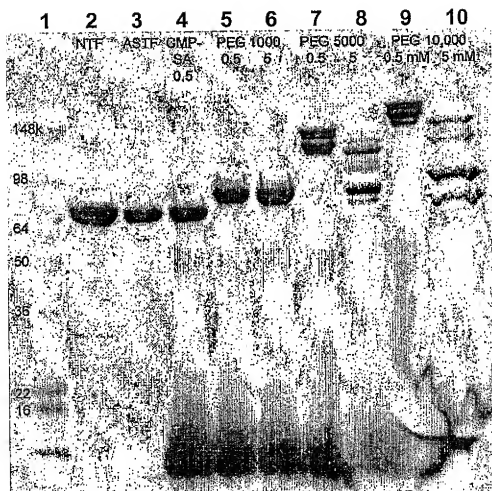


FIG. 114

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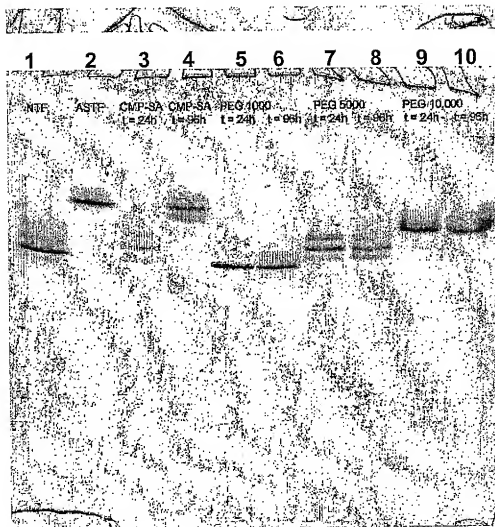


FIG. 115

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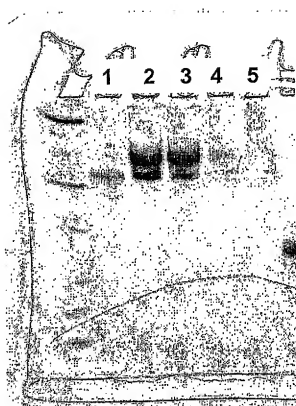


FIG. 116

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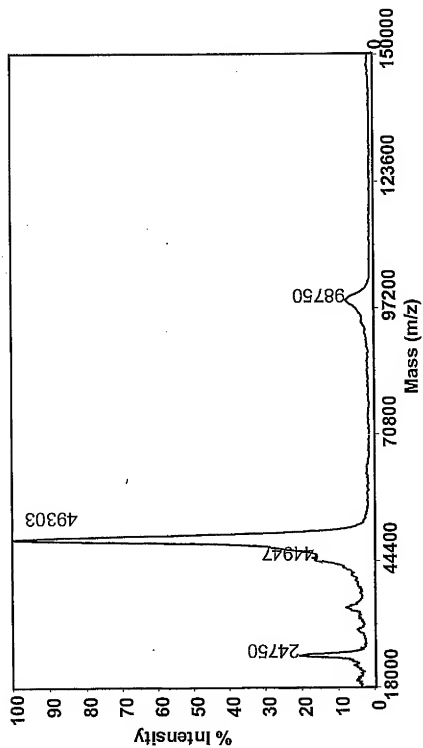


FIG. 117

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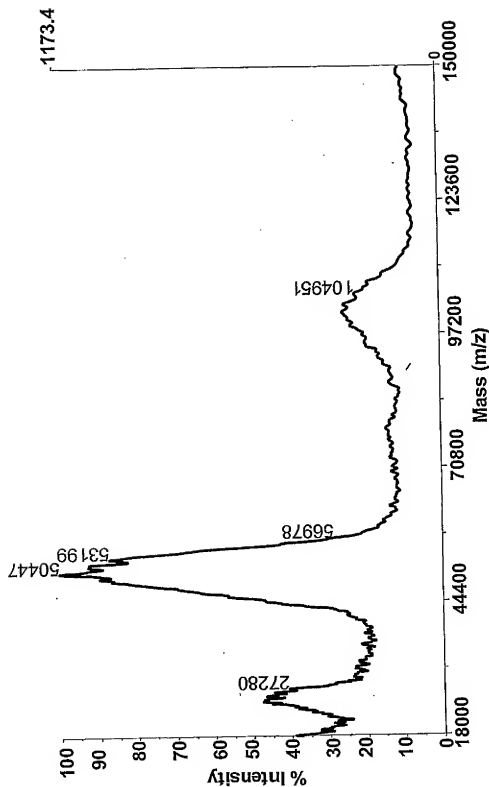


FIG. 118

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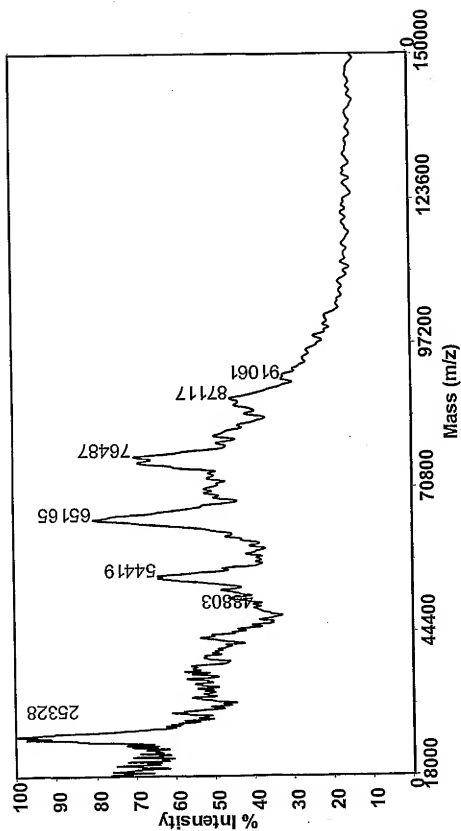


FIG. 119

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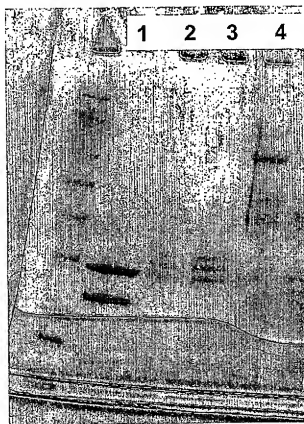


FIG. 120

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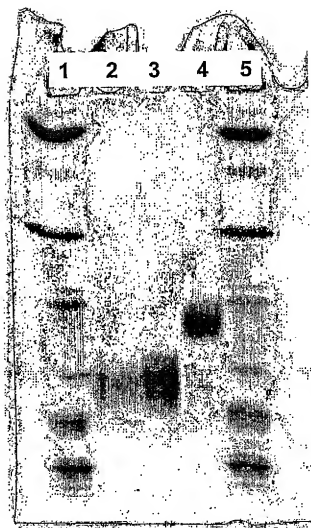


FIG. 121

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FIG. 122

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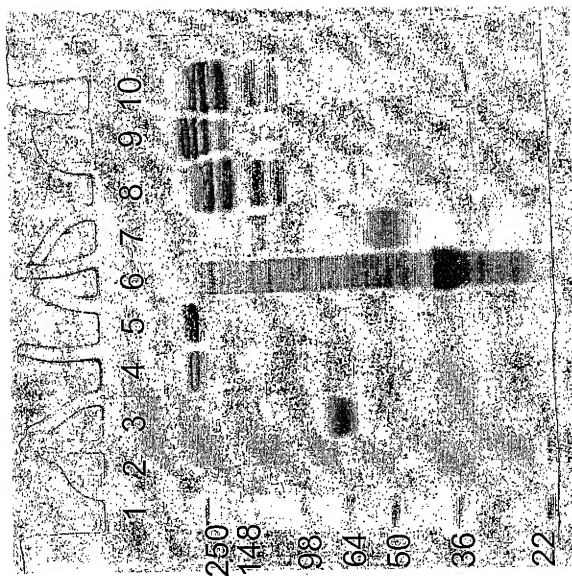


FIG. 123

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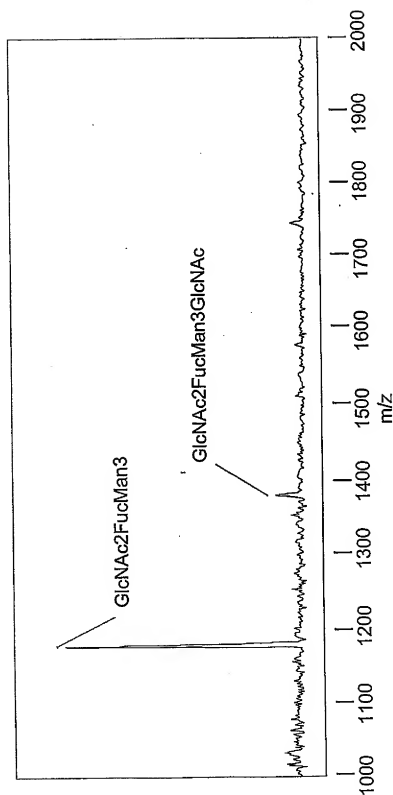


FIG. 124

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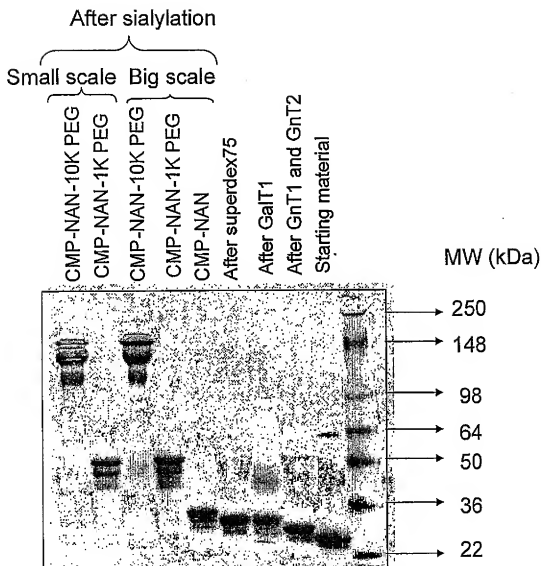


FIG. 125

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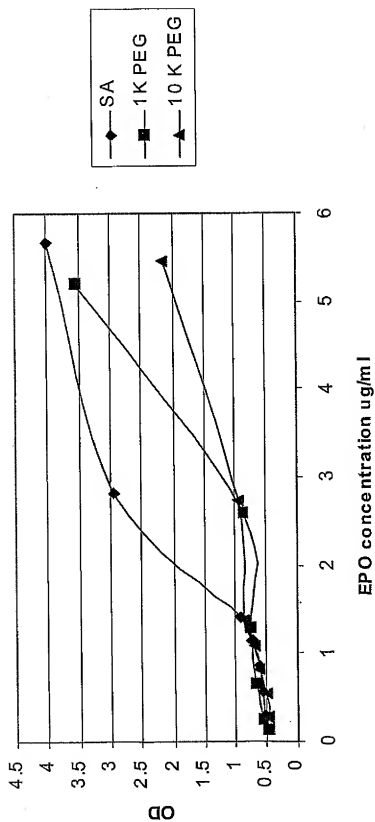


FIG. 126

SEQUENCE LISTING

<110> Neose Technologies, Inc.
 DeFrees, Shawn
 Zopf, David
 Bayer, Robert
 Bowe, Caryn
 Hakes, David
 Chen, Xi

<120> REMODELING AND GLYCOCONJUGATION OF PEPTIDES

<130> 040853-01-5050WO

<150> US 60/328,523

<151> 2001-10-10

<150> US 60/344,692

<151> 2001-10-19

<150> US 60/334,233

<151> 2001-11-08

<150> US 60/334,301

<151> 2001-11-08

<150> US 60/387,292

<151> 2002-06-07

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<151> 2002-06-25

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<151> 2002-08-16

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<151> 2002-08-28

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| gtgaggaaga tccagggcga tggcgacgag ctccaggaga agctgtgtgc cacctacaag | 120 |
| ctgtgccacc cagaggagct ggtgctgtgc ggacaactctc tgggcatccc ctgggctccc | 180 |

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 cccaccttgg acacactgca gctggacgtc gccgactttg ccaccaccat ctggcagcag 360
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 gcctctgctt tccagcgccg ggcaggaggg gtcctggttg cctcccatct gcagagcttc 480
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 <211> 174
 <212> PRT
 <213> Homo sapiens

<400> 2

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 1 5 10 15

Cys Leu Glu Gln Val Arg Lys Ile Gln Gly Asp Gly Ala Ala Leu Gln
 20 25 30

Glu Lys Leu Cys Ala Thr Tyr Lys Leu Cys His Pro Glu Glu Leu Val
 35 40 45

Leu Leu Gly His Ser Leu Gly Ile Pro Trp Ala Pro Leu Ser Ser Cys
 50 55 60

Pro Ser Gln Ala Leu Gln Leu Ala Gly Cys Leu Ser Gln Leu His Ser
 65 70 75 80

Gly Leu Phe Leu Tyr Gln Gly Leu Leu Gln Ala Leu Glu Gly Ile Ser
 85 90 95

Pro Glu Leu Gly Pro Thr Leu Asp Thr Leu Gln Leu Asp Val Ala Asp
 100 105 110

Phe Ala Thr Thr Ile Trp Gln Gln Met Glu Glu Leu Gly Met Ala Pro
 115 120 125

Ala Leu Gln Pro Thr Gln Gly Ala Met Pro Ala Phe Ala Ser Ala Phe
 130 135 140

Gln Arg Arg Ala Gly Gly Val Leu Val Ala Ser His Leu Gln Ser Phe

145

150

155

160

Leu Glu Val Ser Tyr Arg Val Leu Arg His Leu Ala Gln Pro
 165 170

<210> 3

<211> 1733

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<213> Homo sapiens

<400> 3

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 taggatattgt aaatagatac acagtgtata tgtgattaaa atataatggg agattcaatc 240
 agaaaaaagt ttctaataag gctctggggg aaaagaggaa ggaacaata atgaaaaaaa 300
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 agtagaaagt aacacagggg catttggaat atgtaaacga gtatgttccc tatttaaggc 420
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 tcctgcttga aggacagaca tgactttgga ttccccagg aggagtgttg caaccagttc 720
 caaaaggctg aaaccatccc tgtcctccat gagatgatcc agcagatctt caatctcttc 780
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<211> 188

<212> PRT

<213> Homo sapiens

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 20 25 30

Gly Ser Arg Arg Thr Leu Met Leu Leu Ala Gln Met Arg Arg Ile Ser
 35 40 45

Leu Phe Ser Cys Leu Lys Asp Arg His Asp Phe Gly Phe Pro Gln Glu
 50 55 60

Glu Phe Gly Asn Gln Phe Gln Lys Ala Glu Thr Ile Pro Val Leu His
 65 70 75 80

Glu Met Ile Gln Gln Ile Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser
 85 90 95

Ala Ala Trp Asp Glu Thr Leu Leu Asp Lys Phe Tyr Thr Glu Leu Tyr
 100 105 110

Gln Gln Leu Asn Asp Leu Glu Ala Cys Val Ile Gln Gly Val Gly Val
 115 120 125

Thr Glu Thr Pro Leu Met Lys Glu Asp Ser Ile Leu Ala Val Arg Lys
 130 135 140

Tyr Phe Gln Arg Ile Thr Leu Tyr Leu Lys Glu Lys Lys Tyr Ser Pro
 145 150 155 160

Cys Ala Trp Glu Val Val Arg Ala Glu Ile Met Arg Ser Phe Ser Leu
 165 170 175

Ser Thr Asn Leu Gln Glu Ser Leu Arg Ser Lys Glu
 180 185

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 tccatgagct acaacttgct tggattccta caaagaagca gcaattttca gtgtcagaag 120
 ctctctgtggc aattgaatgg gaggcttgaa tattgcctca aggacaggat gaactttgac 180
 atccctgagg agattaagca gctgcagcag ttccagaagg aggacgccgc attgaccatc 240
 tatgagatgc tccagaacat ctttgcattt ttccagacaag attcatctag cactggctgg 300
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 acagtctctg aagaaaaact ggagaaagaa gattttacca ggggaaaact catgagcagt 420
 ctgcacctga aaagatatta tgggaggatt ctgcattacc tgaaggccaa ggagtacagt 480
 cactgtgcct ggaccatagt cagagtggaa atcctaagga acttttactt cattaacaga 540
 cttacaggtt acctccgaaa ctgaagatct cctagcctgt cctctgggga ctggacaatt 600
 gcttcaagca ttcttcaacc agcagatgct gtttaagtga ctgatggcta atgtactgca 660
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 <211> 187
 <212> PRT
 <213> Homo sapiens

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20 25 30

Ser Ser Asn Phe Gln Cys Gln Lys Leu Leu Trp Gln Leu Asn Gly Arg
35 40 45

Leu Glu Tyr Cys Leu Lys Asp Arg Met Asn Phe Asp Ile Pro Glu Glu
50 55 60

Ile Lys Gln Leu Gln Gln Phe Gln Lys Glu Asp Ala Ala Leu Thr Ile
65 70 75 80

Tyr Glu Met Leu Gln Asn Ile Phe Ala Ile Phe Arg Gln Asp Ser Ser
85 90 95

Ser Thr Gly Trp Asn Glu Thr Ile Val Glu Asn Leu Leu Ala Asn Val
100 105 110

Tyr His Gln Ile Asn His Leu Lys Thr Val Leu Glu Glu Lys Leu Glu
115 120 125

Lys Glu Asp Phe Thr Arg Gly Lys Leu Met Ser Ser Leu His Leu Lys
130 135 140

Arg Tyr Tyr Gly Arg Ile Leu His Tyr Leu Lys Ala Lys Glu Tyr Ser
145 150 155 160

His Cys Ala Trp Thr Ile Val Arg Val Glu Ile Leu Arg Asn Phe Tyr
165 170 175

Phe Ile Asn Arg Leu Thr Gly Tyr Leu Arg Asn
180 185

<210> 7

<211> 1332

<212> DNA

<213> Homo sapiens

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gcgttcttcgg aggagctgcg gccgggctcc ctggagaggg agtgcaagga ggagcagtcg 180
tccttcgagg aggcccgga gatcttcaag gacgcggaga ggaogaagct gttctggatt 240

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gaccagctcc agtcctatat ctgcttctgc ctccctgcct tcgagggccg gaactgtgag 360
acgcacaagg atgaccagct gatctgtgtg aacgagaacg gcggctgtga gcagtactgc 420
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gccccatttc cc

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 <212> PRT
 <213> Homo sapiens

<400> 8

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Gly Cys Leu Ala Ala Val Phe Val Thr Gln Glu Glu Ala His Gly Val
 20 25 30

Leu His Arg Arg Arg Arg Ala Asn Ala Phe Leu Glu Glu Leu Arg Pro
 35 40 45

Gly Ser Leu Glu Arg Glu Cys Lys Glu Glu Gln Cys Ser Phe Glu Glu
50 55 60

Ala Arg Glu Ile Phe Lys Asp Ala Glu Arg Thr Lys Leu Phe Trp Ile
65 70 75 80

Ser Tyr Ser Asp Gly Asp Gln Cys Ala Ser Ser Pro Cys Gln Asn Gly
85 90 95

Gly Ser Cys Lys Asp Gln Leu Gln Ser Tyr Ile Cys Phe Cys Leu Pro
100 105 110

Ala Phe Glu Gly Arg Asn Cys Glu Thr His Lys Asp Asp Gln Leu Ile
115 120 125

Cys Val Asn Glu Asn Gly Gly Cys Glu Gln Tyr Cys Ser Asp His Thr
130 135 140

Gly Thr Lys Arg Ser Cys Arg Cys His Glu Gly Tyr Ser Leu Leu Ala
145 150 155 160

Asp Gly Val Ser Cys Thr Pro Thr Val Glu Tyr Pro Cys Gly Lys Ile
165 170 175

Pro Ile Leu Glu Lys Arg Asn Ala Ser Lys Pro Gln Gly Arg Ile Val
180 185 190

Gly Gly Lys Val Cys Pro Lys Gly Glu Cys Pro Trp Gln Val Leu Leu
195 200 205

Leu Val Asn Gly Ala Gln Leu Cys Gly Gly Thr Leu Ile Asn Thr Ile
210 215 220

Trp Val Val Ser Ala Ala His Cys Phe Asp Lys Ile Lys Asn Trp Arg
225 230 235 240

Asn Leu Ile Ala Val Leu Gly Glu His Asp Leu Ser Glu His Asp Gly
245 250 255

Asp Glu Gln Ser Arg Arg Val Ala Gln Val Ile Ile Pro Ser Thr Tyr
260 265 270

Val Pro Gly Thr Thr Asn His Asp Ile Ala Leu Leu Arg Leu His Gln
275 280 285

Pro Val Val Leu Thr Asp His Val Val Pro Leu Cys Leu Pro Glu Arg
290 295 300

Thr Phe Ser Glu Arg Thr Leu Ala Phe Val Arg Phe Ser Leu Val Ser
305 310 315 320

Gly Trp Gly Gln Leu Leu Asp Arg Gly Ala Thr Ala Leu Glu Leu Met
325 330 335

Val Leu Asn Val Pro Arg Leu Met Thr Gln Asp Cys Leu Gln Gln Ser
340 345 350

Arg Lys Val Gly Asp Ser Pro Asn Ile Thr Glu Tyr Met Phe Cys Ala
355 360 365

Gly Tyr Ser Asp Gly Ser Lys Asp Ser Cys Lys Gly Asp Ser Gly Gly
370 375 380

Pro His Ala Thr His Tyr Arg Gly Thr Trp Tyr Leu Thr Gly Ile Val
385 390 395 400

Ser Trp Gly Gln Gly Cys Ala Thr Val Gly His Phe Gly Val Tyr Thr
405 410 415

Arg Val Ser Gln Tyr Ile Glu Trp Leu Gln Lys Leu Met Arg Ser Glu
420 425 430

Pro Arg Pro Gly Val Leu Leu Arg Ala Pro Phe Pro
435 440

<210> 9
<211> 1437
<212> DNA
<213> Homo sapiens

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ggatatctac tcagtgctga atgtacagtt tttcttgatc atgaaaacgc caacaaaatt 120
ctgaatcgcc caaagaggta taattcaggt aaattggaag agtttggtca agggaacctt 180

gagagagaat gtatggaaga aaagtgtagt ttgagaac cagagaagt ttttgaanaac 240
 actgaaaaa caactgaatt ttggaagcag tatgttgatg gagatcagtg tgagtccaat 300
 ccatgtttta atggcggcag ttgcaaggat gacattaatt cctatgaatg ttgggtgtccc 360
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 tgcgagcagt tttgtaaaa tagtgctgat aacaagggtg tttgctctg tactgagga 480
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 aaatattgaa tatataccaa ggtatccgg tatgtcaact ggattaagga aaaaacaaag 1380
 ctacttaat gaaagatgga ttccaagggt taattcattg gaattgaaaa ttaacag 1437

<210> 10

<211> 462

<212> PRT

<213> Homo sapiens

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Ile Cys Leu Leu Gly Tyr Leu Leu Ser Ala Glu Cys Thr Val Phe Leu
 20 25 30

Asp His Glu Asn Ala Asn Lys Ile Leu Asn Arg Pro Lys Arg Tyr Asn
 35 40 45

Ser Gly Lys Leu Glu Glu Phe Val Gln Gly Asn Leu Glu Arg Glu Cys
 50 55 60

Met Glu Glu Lys Cys Ser Phe Glu Glu Pro Arg Glu Val Phe Glu Asn
 65 70 75 80

Thr Glu Lys Thr Thr Glu Phe Trp Lys Gln Tyr Val Asp Gly Asp Gln
 85 90 95

Cys Glu Ser Asn Pro Cys Leu Asn Gly Gly Ser Cys Lys Asp Asp Ile
 100 105 110

Asn Ser Tyr Glu Cys Trp Cys Pro Phe Gly Phe Glu Gly Lys Asn Cys
 115 120 125

Glu Leu Asp Val Thr Cys Asn Ile Lys Asn Gly Arg Cys Glu Gln Phe
 130 135 140

Cys Lys Asn Ser Ala Asp Asn Lys Val Val Cys Ser Cys Thr Glu Gly
 145 150 155 160

Tyr Arg Leu Ala Glu Asn Gln Lys Ser Cys Glu Pro Ala Val Pro Phe
 165 170 175

Pro Cys Gly Arg Val Ser Val Ser Gln Thr Ser Lys Leu Thr Arg Ala
 180 185 190

Glu Ala Val Phe Pro Asp Val Asp Tyr Val Asn Pro Thr Glu Ala Glu
 195 200 205

Thr Ile Leu Asp Asn Ile Thr Gln Gly Thr Gln Ser Phe Asn Asp Phe
 210 215 220

Thr Arg Val Val Gly Gly Glu Asp Ala Lys Pro Gly Gln Phe Pro Trp
 225 230 235 240

Gln Val Val Leu Asn Gly Lys Val Asp Ala Phe Cys Gly Gly Ser Ile
 245 250 255

Val Asn Glu Lys Trp Ile Val Thr Ala Ala His Cys Val Glu Thr Gly
 260 265 270

Val Lys Ile Thr Val Val Ala Gly Glu His Asn Ile Glu Glu Thr Glu
 275 280 285

His Thr Glu Gln Lys Arg Asn Val Ile Arg Ala Ile Ile Pro His His
 290 295 300

Asn Tyr Asn Ala Ala Ile Asn Lys Tyr Asn His Asp Ile Ala Leu Leu
 305 310 315 320

Glu Leu Asp Glu Pro Leu Val Leu Asn Ser Tyr Val Thr Pro Ile Cys
 325 330 335

Ile Ala Asp Lys Glu Tyr Thr Asn Ile Phe Leu Lys Phe Gly Ser Gly
 340 345 350

Tyr Val Ser Gly Trp Ala Arg Val Phe His Lys Gly Arg Ser Ala Leu
 355 360 365

Val Leu Gln Tyr Leu Arg Val Pro Leu Val Asp Arg Ala Thr Cys Leu
 370 375 380

Arg Ser Thr Lys Phe Thr Ile Tyr Asn Asn Met Phe Cys Ala Gly Phe
 385 390 395 400

His Glu Gly Gly Arg Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro His
 405 410 415

Val Thr Glu Val Glu Gly Thr Ser Phe Leu Thr Gly Ile Ile Ser Trp
 420 425 430

Gly Glu Glu Cys Ala Met Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val
 435 440 445

Ser Arg Tyr Val Asn Trp Ile Lys Glu Lys Thr Lys Leu Thr
 450 455 460

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 <211> 603
 <212> DNA
 <213> Homo sapiens

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ttcttctccc agccgggtgc cccaatactt cagtgcattg gctgctgctt ctctagagca      180
tatccactc cactaaggtc caagaagaag atgttggtcc aaaagaacgt cacctcagag      240
tccacttgct gtgtagctaa atcatataac agggtcacag taatggggggg tttcaaagtg      300
gagaaccaca ogcggtgcc ctcagctact tgttattatc acaaatotta aatgttttac      360
caagtgtgtg ctgatgact gctgattttc tggaatggaa aattaagttg tttagtgttt      420
atggctttgt gagataaaac tctccttttc cttaccatac cactttgaca cgcttcaagg      480
atactagcga gctttactgc cttcctcctt atcctacagt acaatcagca gtctagttct      540
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atc                                                                    603

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<210> 12
<211> 116
<212> PRT
<213> Homo sapiens

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<400> 12

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Met Asp Tyr Tyr Arg Lys Tyr Ala Ala Ile Phe Leu Val Thr Leu Ser
1          5          10          15

```

```

Val Phe Leu His Val Leu His Ser Ala Pro Asp Val Gln Asp Cys Pro
          20          25          30

```

```

Glu Cys Thr Leu Gln Glu Asn Pro Phe Phe Ser Gln Pro Gly Ala Pro
          35          40          45

```

```

Ile Leu Gln Cys Met Gly Cys Cys Phe Ser Arg Ala Tyr Pro Thr Pro
          50          55          60

```

```

Leu Arg Ser Lys Lys Thr Met Leu Val Gln Lys Asn Val Thr Ser Glu
65          70          75          80

```

```

Ser Thr Cys Cys Val Ala Lys Ser Tyr Asn Arg Val Thr Val Met Gly
          85          90          95

```

```

Gly Phe Lys Val Glu Asn His Thr Ala Cys His Cys Ser Thr Cys Tyr
          100          105          110

```

Tyr His Lys Ser
115

<210> 13
<211> 390
<212> DNA
<213> Homo sapiens

<400> 13
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tgtgagctga ccaacatcac cattgcaata gagaagaag aatgtcgttt ctgcataagc 120
atcaacacca cttggtgtgc tggctactgc tacaccaggg atctggtgta taaggacca 180
gccaggccca aaatccagaa aacatgtacc ttcaaggaac tggatatga aacagtgaga 240
gtgcccggt gtgctcacca tgcagattcc ttgtatacat acccagtggc caccagtgt 300
cactgtggca agtgtgacag cgacagcact gattgtactg tgcgaggcct ggggccacgc 360
tactgtctct ttggtgaaat gaaagaataa 390

<210> 14
<211> 129
<212> PRT
<213> Homo sapiens

<400> 14

Met Lys Thr Leu Gln Phe Phe Phe Leu Phe Cys Cys Trp Lys Ala Ile
1 5 10 15

Cys Cys Asn Ser Cys Glu Leu Thr Asn Ile Thr Ile Ala Ile Glu Lys
20 25 30

Glu Glu Cys Arg Phe Cys Ile Ser Ile Asn Thr Thr Trp Cys Ala Gly
35 40 45

Tyr Cys Tyr Thr Arg Asp Leu Val Tyr Lys Asp Pro Ala Arg Pro Lys
50 55 60

Ile Gln Lys Thr Cys Thr Phe Lys Glu Leu Val Tyr Glu Thr Val Arg
65 70 75 80

Val Pro Gly Cys Ala His His Ala Asp Ser Leu Tyr Thr Tyr Pro Val
85 90 95

Ala Thr Gln Cys His Cys Gly Lys Cys Asp Ser Asp Ser Thr Asp Cys
100 105 110

Thr Val Arg Gly Leu Gly Pro Ser Tyr Cys Ser Phe Gly Glu Met Lys
115 120 125

Glu

<210> 15
<211> 1342
<212> DNA
<213> Homo sapiens

<400> 15
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gccccgggtg tggtcaccgc gcgcgcccga ggctgctgag ggaccccgcc caggcgcgga 180
gatgggggtg cacgaatgct ctgcttggtg gtgcttctc ctgtccctgc tgtgctccc 240
tctgggctc ccagctctgg gcgccccacc acgcctcctc tgtgacagcc gagtccctgga 300
gaggtacctc ttggaggcca aggaggccga gaatatcacg acgggctgtg ctgaacactg 360
cagcttgaat gagaatatca ctgtcccaga caccaaagtt aatttctatg cctggaagag 420
gatggaggtc gggcagcagg ccgtagaagt ctggcagggc ctggccctgc tgtcggaagc 480
tgtctgcgg ggccaggccc tgttggtcaa ctctcccg ccgtgggagc cctgcagct 540
gcatgtggat aaagccgtca gtggccttcg cagcctcacc actctgcttc gggctctcg 600
agccagaag gaagccatct cccctccaga tgcggcctca gctgctccac tccgaacaat 660
cactgctgac actttccgca aactcttcg agtctactcc aatttctctc ggggaagct 720
gaagctgtac acaggggagg cctgcaggac aggggacaga tgaccaggtg tgtccacctg 780
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gaacccctgc gaggggctct cagctcagcg ccagctgtgc ccattggcac tccagtgcga 900
gcaatgacat ctgagggggc agaggaaactg tccagagagc aactctgaga tctaaggatg 960
tcacagggcc aacttgaggc ccagagcagc gaagcattca gagagcagct ttaactcag 1020
ggacagagcc atgctgggaa gacgcctgag ctactcggc accctgcaaa atttgatgcc 1080
aggacacgct ttggaggcga tttaacctgt ttgcaccta ccactcagga caggatgacc 1140

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tgggagaactt aggtgggcaag ctgtgacttc tccaggtctc acgggcatgg gcactccctt 1200
ggtgggcaaga gccccttga caccgggggtg gtgggaacca tgaagacagg atgggggctg 1260
gcctctgggt ctcctgggtt ccaagttttg tgtattcttc aacctcattg acaagaactg 1320
aaaccaccaa aaaaaaaaaa aa 1342

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<210> 16
<211> 193
<212> PRT
<213> Homo sapiens

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<400> 16

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Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
1           5           10           15

```

```

Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Ala Pro Pro Arg Leu
          20           25           30

```

```

Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu
          35           40           45

```

```

Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His Cys Ser Leu Asn Glu
          50           55           60

```

```

Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe Tyr Ala Trp Lys Arg
65           70           75           80

```

```

Met Glu Val Gly Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu
          85           90           95

```

```

Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser
          100          105          110

```

```

Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp Lys Ala Val Ser Gly
          115          120          125

```

```

Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu Arg Ala Gln Lys Glu
          130          135          140

```

```

Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg Thr Ile
          145          150          155          160

```

```

Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val Tyr Ser Asn Phe Leu

```

165

170

175

Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala Cys Arg Thr Gly Asp
 180 185 190

Arg

<210> 17
 <211> 435
 <212> DNA
 <213> Homo sapiens

<400> 17
 atgtggctgc agagcctgct gctcttgggc actgtggcct gcagcatctc tgcacccgcc 60
 cgctcgccca gccccagcac gcagccctgg gagcatgtga atgccatcca ggaggcccg 120
 cgtctcctga acctgagtag agacactgct gctgagatga atgaaacagt agaagtcac 180
 tcagaaatgt ttgacctcca ggagccgacc tgcctacaga ccogcctgga gctgtacaag 240
 cagggcctgc ggggcagcct caccaagctc aagggccctc tgaccatgat ggcagccac 300
 tacaagcagc actgccctcc aaccccgaa acttctctgt caaccagat tatcaccttt 360
 gaaagtcca aagagaacct gaaggacttt ctgcttctga tcccccttga ctgctgggag 420
 ccagtccagg agtga 435

<210> 18
 <211> 144
 <212> PRT
 <213> Homo sapiens

<400> 18

Met Trp Leu Gln Ser Leu Leu Leu Gly Thr Val Ala Cys Ser Ile
 1 5 10 15

Ser Ala Pro Ala Arg Ser Pro Ser Pro Ser Thr Gln Pro Trp Glu His
 20 25 30

Val Asn Ala Ile Gln Glu Ala Arg Arg Leu Leu Asn Leu Ser Arg Asp
 35 40 45

Thr Ala Ala Glu Met Asn Glu Thr Val Glu Val Ile Ser Glu Met Phe
 50 55 60

Asp Leu Gln Glu Pro Thr Cys Leu Gln Thr Arg Leu Glu Leu Tyr Lys
65 70 75 80

Gln Gly Leu Arg Gly Ser Leu Thr Lys Leu Lys Gly Pro Leu Thr Met
85 90 95

Met Ala Ser His Tyr Lys Gln His Cys Pro Pro Thr Pro Glu Thr Ser
100 105 110

Cys Ala Thr Gln Ile Ile Thr Phe Glu Ser Phe Lys Glu Asn Leu Lys
115 120 125

Asp Phe Leu Leu Val Ile Pro Phe Asp Cys Trp Glu Pro Val Gln Glu
130 135 140

<210> 19
<211> 501
<212> DNA
<213> Homo sapiens

<400> 19
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tggtactgcc aggaccata tgtaaaagaa gcagaaaacc ttaagaaata ttttaatgca 120
ggtcattcag atgtagcgga taatggaact cttttcttag gcattttgaa gaattggaaa 180
gaggagagtg acagaaaaat aatgcagagc caaattgtct ctttttactt caaacttttt 240
aaaaacttta aagatgacca gagcatccaa aagagtgtgg agaccatcaa ggaagacatg 300
aatgtcaagt ttttcaatag caacaaaaag aaacgagatg acttcgaaaa gctgactaat 360
tattcggttaa ctgacttgaa tgccaacgc aaagcaatac atgaactcat ccaagtgatg 420
gctgaactgt cgccagcagc taaaacaggg aagcgaaaaa ggagtcagat gctgtttcga 480
ggtcgaagag catccagta a 501

<210> 20
<211> 166
<212> PRT
<213> Homo sapiens

<400> 20

Met Lys Tyr Thr Ser Tyr Ile Leu Ala Phe Gln Leu Cys Ile Val Leu
1 5 10 15

Gly Ser Leu Gly Cys Tyr Cys Gln Asp Pro Tyr Val Lys Glu Ala Glu

20

25

30

Asn Leu Lys Lys Tyr Phe Asn Ala Gly His Ser Asp Val Ala Asp Asn
 35 40 45

Gly Thr Leu Phe Leu Gly Ile Leu Lys Asn Trp Lys Glu Glu Ser Asp
 50 55 60

Arg Lys Ile Met Gln Ser Gln Ile Val Ser Phe Tyr Phe Lys Leu Phe
 65 70 75 80

Lys Asn Phe Lys Asp Asp Gln Ser Ile Gln Lys Ser Val Glu Thr Ile
 85 90 95

Lys Glu Asp Met Asn Val Lys Phe Phe Asn Ser Asn Lys Lys Lys Arg
 100 105 110

Asp Asp Phe Glu Lys Leu Thr Asn Tyr Ser Val Thr Asp Leu Asn Val
 115 120 125

Gln Arg Lys Ala Ile His Glu Leu Ile Gln Val Met Ala Glu Leu Ser
 130 135 140

Pro Ala Ala Lys Thr Gly Lys Arg Lys Arg Ser Gln Met Leu Phe Arg
 145 150 155 160

Gly Arg Arg Ala Ser Gln
 165

<210> 21

<211> 1352

<212> DNA

<213> Homo sapiens

<400> 21

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 gacagataca tcccaacctg atcaggatca cccaaccttc aacaagatca cccccaacct 180
 ggctgagttc gccttcagcc tataccgcc gctggcacac cagtccaaca gcaccaatat 240
 cttctctctc ccagttagca tcgtctacgc ctttgcaatg ctctccttgg ggaccaaggc 300
 tgacactcac gatgaaatcc tggagggcct gaatttcaac' ctcaoggaga ttcoggaggc 360

tcagatccat gaaggcttcc aggaactcct ccgtaccctc aaccagccag acagccagct 420
 ccagctgacc accggcaatg gcctgttccct cagcgagggc ctgaagctag tggataagtt 480
 tttggaggat gttaaaaagt tgtaccactc agaagccttc actgtcaact tcggggacac 540
 cgaagaggcc aagaacacaga tcaacgatta cgtggagaag ggtactcaag ggaaaattgt 600
 ggatttggtc aaggagcttg acagagacac agtttttgct ctgggtgaatt acatcttctt 660
 taaaggcaaa tgggagagac cctttgaagt caaggacacc gaggaagagg acttccacgt 720
 ggaccagggt accaccgtga aggtgcctat gatgaagcgt ttaggcatgt ttaacatcca 780
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 tatcatcacc aagttcctgg aaaatgaaga cagaaggctc gccagcttac atttacccaa 960
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 tgtcttctta atgattgaac aaaataccaa gtctccccct tcatgggaa aagtggtgaa 1260
 tccccccaa aaataactgc ctctcgctcc tcaaccctc ccctccatcc ctggccccct 1320
 ccctggatga cattaaagaa ggggtgagct gg 1352

<210> 22
 <211> 418
 <212> PRT
 <213> Homo sapiens

<400> 22

Met Pro Ser Ser Val Ser Trp Gly Ile Leu Leu Leu Ala Gly Leu Cys
 1 5 10 15

Cys Leu Val Pro Val Ser Leu Ala Glu Asp Pro Gln Gly Asp Ala Ala
 20 25 30

Gln Lys Thr Asp Thr Ser His His Asp Gln Asp His Pro Thr Phe Asn
 35 40 45

Lys Ile Thr Pro Asn Leu Ala Glu Phe Ala Phe Ser Leu Tyr Arg Gln
 50 55 60

Leu Ala His Gln Ser Asn Ser Thr Asn Ile Phe Phe Ser Pro Val Ser
 65 70 75 80

Ile Ala Thr Ala Phe Ala Met Leu Ser Leu Gly Thr Lys Ala Asp Thr
 85 90 95

His Asp Glu Ile Leu Glu Gly Leu Asn Phe Asn Leu Thr Glu Ile Pro
 100 105 110

Glu Ala Gln Ile His Glu Gly Phe Gln Glu Leu Leu Arg Thr Leu Asn
 115 120 125

Gln Pro Asp Ser Gln Leu Gln Leu Thr Thr Gly Asn Gly Leu Phe Leu
 130 135 140

Ser Glu Gly Leu Lys Leu Val Asp Lys Phe Leu Glu Asp Val Lys Lys
 145 150 155 160

Leu Tyr His Ser Glu Ala Phe Thr Val Asn Phe Gly Asp Thr Glu Glu
 165 170 175

Ala Lys Lys Gln Ile Asn Asp Tyr Val Glu Lys Gly Thr Gln Gly Lys
 180 185 190

Ile Val Asp Leu Val Lys Glu Leu Asp Arg Asp Thr Val Phe Ala Leu
 195 200 205

Val Asn Tyr Ile Phe Phe Lys Gly Lys Trp Glu Arg Pro Phe Glu Val
 210 215 220

Lys Asp Thr Glu Glu Glu Asp Phe His Val Asp Gln Val Thr Thr Val
 225 230 235 240

Lys Val Pro Met Met Lys Arg Leu Gly Met Phe Asn Ile Gln His Cys
 245 250 255

Lys Lys Leu Ser Ser Trp Val Leu Leu Met Lys Tyr Leu Gly Asn Ala
 260 265 270

Thr Ala Ile Phe Phe Leu Pro Asp Glu Gly Lys Leu Gln His Leu Glu
 275 280 285

Asn Glu Leu Thr His Asp Ile Ile Thr Lys Phe Leu Glu Asn Glu Asp
 290 295 300

Arg Arg Ser Ala Ser Leu His Leu Pro Lys Leu Ser Ile Thr Gly Thr
 305 310 315 320

Tyr Asp Leu Lys Ser Val Leu Gly Gln Leu Gly Ile Thr Lys Val Phe
 325 330 335

Ser Asn Gly Ala Asp Leu Ser Gly Val Thr Glu Glu Ala Pro Leu Lys
 340 345 350

Leu Ser Lys Ala Val His Lys Ala Val Leu Thr Ile Asp Glu Lys Gly
 355 360 365

Thr Glu Ala Ala Gly Ala Met Phe Leu Glu Ala Ile Pro Met Ser Ile
 370 375 380

Pro Pro Glu Val Lys Phe Asn Lys Pro Phe Val Phe Leu Met Ile Glu
 385 390 395 400

Gln Asn Thr Lys Ser Pro Leu Phe Met Gly Lys Val Val Asn Pro Thr
 405 410 415

Gln Lys

<210> 23
 <211> 2004
 <212> DNA
 <213> Homo sapiens

<400> 23
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 ggatggagtt ttcaagtctt tccagagagg aatgtcccaa gcctttgagt agggtaagca 180
 tcatggctgg cagcctcaca ggtttgcttc tacttcaggc agtgcgtggt gcatcagggtg 240
 ccgcgccctg catccctaaa agcttcgggt acagctcggg ggtgtgtgtc tgcaatgcc 300
 catactgtga ctcccttgac ccccgacct ttccctgcct tggtaccttc agcgcctatg 360
 agagtacag cagtggggcga cggatggagc tgagtatggg gcccatccag gctaatacaca 420
 cgggcacagg cctgctactg acctgcagc cagaacagaa gtccagaaa gtgaagggat 480

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|--|------|
| btggaggggc catgacagat gctgctgctc tcaacatcct tgccctgtca cccctgtccc | 540 |
| aaaatttgcct acttaaatcg tacttctctg aagaaggaat cggatataac atcatccggg | 600 |
| taccatggc cagctgtgac ttctccatcc gcacctacac ctatgcagac acccctgatg | 660 |
| atttccagtt gcacaacttc agcctcccag aggaagatac caagctcaag atacccttga | 720 |
| ttcaccgagc cctgcagttg gccagcgtc ccgtttcact ccttgccagc ccttgacat | 780 |
| caccacttg gctcaagacc aatggagcgg tgaatgggaa ggggtcactc aaggagcagc | 840 |
| ccggagacat ctaccaccag acctgggcca gatactttgt gaagttcctg gatgcctatg | 900 |
| ctgagcaca gttacagttc tgggcagtg cagctgaaaa tgagccttct gctgggctgt | 960 |
| tgagtggata ccccttccag tgccctggct tcacccctga acatcagcga gacttcattg | 1020 |
| cccgtagcct aggtcctacc ctgcacaaca gtactcacca caatgtccgc ctactcatgc | 1080 |
| tggatgacca acgcttctg ctgcccact gggcaaaagt ggtactgaca gaccagaag | 1140 |
| cagctaaata tgttcattgc attgctgtac attggtacct ggactttctg gctccagcca | 1200 |
| aagccacct aggggagaca caccgctgt tcccacaac catgctcttt gctcagagg | 1260 |
| cctgtgtggg ctccaagttc tgggagcaga gtgtgctggc aggtcctcgg gatcagagg | 1320 |
| tgagtagcag ccacagcacc atcacgaacc tctgtacca tgggtcggc tggaccgact | 1380 |
| ggaaccttgc cctgaacccc gaaggaggac ccaattgggt gcgtacttt gtgcacagtc | 1440 |
| ccatcattgt agacatcacc aaggacacgt tttaaaaaa gcccatgttc taccacctg | 1500 |
| gccacttcag caagttcatt cctgagggt cccagagagt ggggtgggt gccagtcaga | 1560 |
| agaacgacct ggacgcagtg gcactgatgc atccgatgg ctctgctgtt gtggtcgtgc | 1620 |
| taaacggctc ctctaaggat gtgcctctta ccataagga tctgtgtgtg ggcttctgtg | 1680 |
| agacaatctc acctggctac tccattoaca cctacctgtg gcacgccag tgatggagca | 1740 |
| gatactcaag gaggcacttg gctcagcctg ggcattaaa ggacagagtc agctcacacg | 1800 |
| ctgtctgtga ctaaaagagg cacagcagg ccagtggtg attacagcga cgttaagcca | 1860 |
| ggggcaatgg tttgggtgac tcactttccc ctctaggtgg tgcccaggc tggaggcccc | 1920 |
| tagaaaaaga tcagtaagcc ccagtgtccc cccagcccc atgcttatgt gaacatgcgc | 1980 |
| tgtgtgctgc ttgctttgga aact | 2004 |

<210> 24
 <211> 536
 <212> PRT

<213> Homo sapiens

<400> 24

Met Glu Phe Ser Ser Pro Ser Arg Glu Glu Cys Pro Lys Pro Leu Ser
 1 5 10 15

Arg Val Ser Ile Met Ala Gly Ser Leu Thr Gly Leu Leu Leu Gln
 20 25 30

Ala Val Ser Trp Ala Ser Gly Ala Arg Pro Cys Ile Pro Lys Ser Phe
 35 40 45

Gly Tyr Ser Ser Val Val Cys Val Cys Asn Ala Thr Tyr Cys Asp Ser
 50 55 60

Phe Asp Pro Pro Thr Phe Pro Ala Leu Gly Thr Phe Ser Arg Tyr Glu
 65 70 75 80

Ser Thr Arg Ser Gly Arg Arg Met Glu Leu Ser Met Gly Pro Ile Gln
 85 90 95

Ala Asn His Thr Gly Thr Gly Leu Leu Leu Thr Leu Gln Pro Glu Gln
 100 105 110

Lys Phe Gln Lys Val Lys Gly Phe Gly Gly Ala Met Thr Asp Ala Ala
 115 120 125

Ala Leu Asn Ile Leu Ala Leu Ser Pro Pro Ala Gln Asn Leu Leu Leu
 130 135 140

Lys Ser Tyr Phe Ser Glu Glu Gly Ile Gly Tyr Asn Ile Ile Arg Val
 145 150 155 160

Pro Met Ala Ser Cys Asp Phe Ser Ile Arg Thr Tyr Thr Tyr Ala Asp
 165 170 175

Thr Pro Asp Asp Phe Gln Leu His Asn Phe Ser Leu Pro Glu Glu Asp
 180 185 190

Thr Lys Leu Lys Ile Pro Leu Ile His Arg Ala Leu Gln Leu Ala Gln
 195 200 205

Arg Pro Val Ser Leu Leu Ala Ser Pro Trp Thr Ser Pro Thr Trp Leu

| | | |
|--|-----|-----|
| 210 | 215 | 220 |
| Lys Thr Asn Gly Ala Val Asn Gly Lys Gly Ser Leu Lys Gly Gln Pro 225 230 235 240 | | |
| Gly Asp Ile Tyr His Gln Thr Trp Ala Arg Tyr Phe Val Lys Phe Leu 245 250 255 | | |
| Asp Ala Tyr Ala Glu His Lys Leu Gln Phe Trp Ala Val Thr Ala Glu 260 265 270 | | |
| Asn Glu Pro Ser Ala Gly Leu Leu Ser Gly Tyr Pro Phe Gln Cys Leu 275 280 285 | | |
| Gly Phe Thr Pro Glu His Gln Arg Asp Phe Ile Ala Arg Asp Leu Gly 290 295 300 | | |
| Pro Thr Leu Ala Asn Ser Thr His His Asn Val Arg Leu Leu Met Leu 305 310 315 320 | | |
| Asp Asp Gln Arg Leu Leu Leu Pro His Trp Ala Lys Val Val Leu Thr 325 330 335 | | |
| Asp Pro Glu Ala Ala Lys Tyr Val His Gly Ile Ala Val His Tyr Tyr 340 345 350 | | |
| Leu Asp Phe Leu Ala Pro Ala Lys Ala Thr Leu Gly Glu Thr His Arg 355 360 365 | | |
| Leu Phe Pro Asn Thr Met Leu Phe Ala Ser Glu Ala Cys Val Gly Ser 370 375 380 | | |
| Lys Phe Trp Glu Gln Ser Val Arg Leu Gly Ser Trp Asp Arg Gly Met 385 390 395 400 | | |
| Gln Tyr Ser His Ser Ile Ile Thr Asn Leu Leu Tyr His Val Val Gly 405 410 415 | | |
| Trp Thr Asp Trp Asn Leu Ala Leu Asn Pro Glu Gly Gly Pro Asn Trp 420 425 430 | | |
| Val Arg Asn Phe Val Asp Ser Pro Ile Ile Val Asp Ile Thr Lys Asp 435 440 445 | | |

Thr Phe Tyr Lys Gln Pro Met Phe Tyr His Leu Gly His Phe Ser Lys
 450 455 460

Phe Ile Pro Glu Gly Ser Gln Arg Val Gly Leu Val Ala Ser Gln Lys
 465 470 475 480

Asn Asp Leu Asp Ala Val Ala Leu Met His Pro Asp Gly Ser Ala Val
 485 490 495

Val Val Val Leu Asn Arg Ser Ser Lys Asp Val Pro Leu Thr Ile Lys
 500 505 510

Asp Pro Ala Val Gly Phe Leu Glu Thr Ile Ser Pro Gly Tyr Ser Ile
 515 520 525

His Thr Tyr Leu Trp His Arg Gln
 530 535

<210> 25
 <211> 1726
 <212> DNA
 <213> Homo sapiens

<400> 25
 atggatgcaa tgaagagagg gctctgctgt gtgtgctgctg tgtgtggagc agtcttcgtt 60
 tgcgccagcc aggaatcca tgccgattc agaagaggag coagatctta ccaagtgtac 120
 tgcagagatg aaaaaacgca gatgatatac cagcaacatc agtcattggt ggcctctgtg 180
 ctcaagca acoggggtgga atattgctgg tgcaacagtg gcagggcaca gtgocactca 240
 gtgcctgtca aaagttgcag cgagccaagg tgtttcaacg ggggcacctg ccagcaggcc 300
 ctgtacttct cagatttcgt gtgocagtgc ccgaaggat ttgctgggaa gtgctgtgaa 360
 atagatacca gggccacgtg ctacgaggac cagggcacat gctacagggg caogtggagc 420
 acagcggaga gtgggcccga gtgcaccaac tggaaacagc gcgcgttgcc ccagaagccc 480
 tacagcgggc ggaggccaga cgccatcagg ctgggccttg ggaaccacaa ctactgcaga 540
 aaccocagatc gagactcaaa gccctgggtg tactcttcta agcgggggaa gtacagctca 600
 gagttctgca gcaccctctg ctgctctgag ggaacacagt actgctactt tgggaatggg 660
 tcagcctacc gtggcacgca cagcctcacc ggtcgggtg cctcctgcct cccgtggaat 720
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Ile Tyr Gln Gln His Gln Ser Trp Leu Arg Pro Val Leu Arg Ser Asn
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Arg Val Glu Tyr Cys Trp Cys Asn Ser Gly Arg Ala Gln Cys His Ser
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Cys Gln Gln Ala Leu Tyr Phe Ser Asp Phe Val Cys Gln Cys Pro Glu
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Gly Phe Ala Gly Lys Cys Cys Glu Ile Asp Thr Arg Ala Thr Cys Tyr
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Glu Asp Gln Gly Ile Ser Tyr Arg Gly Thr Trp Ser Thr Ala Glu Ser
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Gly Ala Glu Cys Thr Asn Trp Asn Ser Ser Ala Leu Ala Gln Lys Pro
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Tyr Ser Gly Arg Arg Pro Asp Ala Ile Arg Leu Gly Leu Gly Asn His
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Asn Tyr Cys Arg Asn Pro Asp Arg Asp Ser Lys Pro Trp Cys Tyr Val
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Phe Lys Ala Gly Lys Tyr Ser Ser Glu Phe Cys Ser Thr Pro Ala Cys
 195 200 205

Ser Glu Gly Asn Ser Asp Cys Tyr Phe Gly Asn Gly Ser Ala Tyr Arg
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Gly Thr His Ser Leu Thr Glu Ser Gly Ala Ser Cys Leu Pro Trp Asn
 225 230 235 240

Ser Met Ile Leu Ile Gly Lys Val Tyr Thr Ala Gln Asn Pro Ser Ala
 245 250 255

Gln Ala Leu Gly Leu Gly Lys His Asn Tyr Cys Arg Asn Pro Asp Gly
 260 265 270

Asp Ala Lys Pro Trp Cys His Val Leu Lys Asn Arg Arg Leu Thr Trp
 275 280 285

Glu Tyr Cys Asp Val Pro Ser Cys Ser Thr Cys Gly Leu Arg Gln Tyr

290

295

300

Ser Gln Pro Gln Phe Arg Ile Lys Gly Gly Leu Phe Ala Asp Ile Ala
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Ser His Pro Trp Gln Ala Ala Ile Phe Ala Lys His Arg Arg Ser Pro
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Gly Glu Arg Phe Leu Cys Gly Gly Ile Leu Ile Ser Ser Cys Trp Ile
 340 345 350

Leu Ser Ala Ala His Cys Phe Gln Glu Arg Phe Pro Pro His His Leu
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Thr Val Ile Leu Gly Arg Thr Tyr Arg Val Val Pro Gly Glu Glu Glu
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Gln Lys Phe Glu Val Glu Lys Tyr Ile Val His Lys Glu Phe Asp Asp
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Asp Thr Tyr Asp Asn Asp Ile Ala Leu Leu Gln Leu Lys Ser Asp Ser
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Ser Arg Cys Ala Gln Glu Ser Ser Val Val Arg Thr Val Cys Leu Pro
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Pro Ala Asp Leu Gln Leu Pro Asp Trp Thr Glu Cys Glu Leu Ser Gly
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Tyr Gly Lys His Glu Ala Leu Ser Pro Phe Tyr Ser Glu Arg Leu Lys
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Glu Ala His Val Arg Leu Tyr Pro Ser Ser Arg Cys Thr Ser Gln His
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Leu Leu Asn Arg Thr Val Thr Asp Asn Met Leu Cys Ala Gly Asp Thr
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Arg Ser Gly Gly Pro Gln Ala Asn Leu His Asp Ala Cys Gln Gly Asp
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Ser Gly Gly Pro Leu Val Cys Leu Asn Asp Gly Arg Met Thr Leu Val
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Val Tyr Thr Lys Val Thr Asn Tyr Leu Asp Trp Ile Arg Asp Asn Met
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Arg Pro

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<210> 28
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 <212> PRT
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<400> 28

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| | | 20 | | | | | | 25 | | | | | 30 | | | |
| Thr | Gln | Leu | Gln | Leu | Glu | His | Leu | Leu | Leu | Asp | Leu | Gln | Met | Ile | Leu | |
| | 35 | | | | | | 40 | | | | | 45 | | | | |
| Asn | Gly | Ile | Asn | Asn | Tyr | Lys | Asn | Pro | Lys | Leu | Thr | Arg | Met | Leu | Thr | |
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| Phe | Lys | Phe | Tyr | Met | Pro | Lys | Lys | Ala | Thr | Glu | Leu | Lys | Gln | Leu | Gln | |
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| Cys | Leu | Glu | Glu | Glu | Leu | Lys | Pro | Leu | Glu | Glu | Val | Leu | Asn | Leu | Ala | |
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| Gln | Ser | Lys | Asn | Phe | His | Leu | Arg | Pro | Arg | Asp | Leu | Ile | Ser | Asn | Ile | |
| | | | 100 | | | | | 105 | | | | | 110 | | | |
| Asn | Val | Ile | Val | Leu | Glu | Leu | Lys | Gly | Ser | Glu | Thr | Thr | Phe | Met | Cys | |
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| Ile | Thr | Phe | Cys | Gln | Ser | Ile | Ile | Ser | Thr | Leu | Thr | | | | | |
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| | |
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Trp Asp Tyr Met Gln Ser Asp Leu Gly Glu Leu Pro Val Asp Ala Arg
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Phe Pro Pro Arg Val Pro Lys Ser Phe Pro Phe Asn Thr Ser Val Val
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Tyr Lys Lys Thr Leu Phe Val Glu Phe Thr Asp His Leu Phe Asn Ile
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Ala Lys Pro Arg Pro Pro Trp Met Gly Leu Leu Gly Pro Thr Ile Gln
 85 90 95

Ala Glu Val Tyr Asp Thr Val Val Ile Thr Leu Lys Asn Met Ala Ser
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His Pro Val Ser Leu His Ala Val Gly Val Ser Tyr Trp Lys Ala Ser
 115 120 125

Glu Gly Ala Glu Tyr Asp Asp Gln Thr Ser Gln Arg Glu Lys Glu Asp
 130 135 140

Asp Lys Val Phe Pro Gly Gly Ser His Thr Tyr Val Trp Gln Val Leu
 145 150 155 160

Lys Glu Asn Gly Pro Met Ala Ser Asp Pro Leu Cys Leu Thr Tyr Ser
 165 170 175

Tyr Leu Ser His Val Asp Leu Val Lys Asp Leu Asn Ser Gly Leu Ile
 180 185 190

Gly Ala Leu Leu Val Cys Arg Glu Gly Ser Leu Ala Lys Glu Lys Thr
 195 200 205

Gln Thr Leu His Lys Phe Ile Leu Leu Phe Ala Val Phe Asp Glu Gly
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Lys Ser Trp His Ser Glu Thr Lys Asn Ser Leu Met Gln Asp Arg Asp
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Ala Ala Ser Ala Arg Ala Trp Pro Lys Met His Thr Val Asn Gly Tyr
 245 250 255

Val Asn Arg Ser Leu Pro Gly Leu Ile Gly Cys His Arg Lys Ser Val
 260 265 270

Tyr Trp His Val Ile Gly Met Gly Thr Thr Pro Glu Val His Ser Ile
 275 280 285

Phe Leu Glu Gly His Thr Phe Leu Val Arg Asn His Arg Gln Ala Ser
 290 295 300

Leu Glu Ile Ser Pro Ile Thr Phe Leu Thr Ala Gln Thr Leu Leu Met
 305 310 315 320

Asp Leu Gly Gln Phe Leu Leu Phe Cys His Ile Ser Ser His Gln His
 325 330 335

Asp Gly Met Glu Ala Tyr Val Lys Val Asp Ser Cys Pro Glu Glu Pro
 340 345 350

Gln Leu Arg Met Lys Asn Asn Glu Glu Ala Glu Asp Tyr Asp Asp Asp
 355 360 365

Leu Thr Asp Ser Glu Met Asp Val Val Arg Phe Asp Asp Asp Asn Ser
 370 375 380

Pro Ser Phe Ile Gln Ile Arg Ser Val Ala Lys Lys His Pro Lys Thr
 385 390 395 400

Trp Val His Tyr Ile Ala Ala Glu Glu Glu Asp Trp Asp Tyr Ala Pro
 405 410 415

Leu Val Leu Ala Pro Asp Asp Arg Ser Tyr Lys Ser Gln Tyr Leu Asn
 420 425 430

Asn Gly Pro Gln Arg Ile Gly Arg Lys Tyr Lys Lys Val Arg Phe Met
 435 440 445

Ala Tyr Thr Asp Glu Thr Phe Lys Thr Arg Glu Ala Ile Gln His Glu
 450 455 460

Ser Gly Ile Leu Gly Pro Leu Leu Tyr Gly Glu Val Gly Asp Thr Leu
 465 470 475 480

Leu Ile Ile Phe Lys Asn Gln Ala Ser Arg Pro Tyr Asn Ile Tyr Pro
 485 490 495

His Gly Ile Thr Asp Val Arg Pro Leu Tyr Ser Arg Arg Leu Pro Lys
 500 505 510

Gly Val Lys His Leu Lys Asp Phe Pro Ile Leu Pro Gly Glu Ile Phe
 515 520 525

Lys Tyr Lys Trp Thr Val Thr Val Glu Asp Gly Pro Thr Lys Ser Asp
 530 535 540

Pro Arg Cys Leu Thr Arg Tyr Tyr Ser Ser Phe Val Asn Met Glu Arg

| | | | |
|---|-----|-----|-----|
| 545 | 550 | 555 | 560 |
| Asp Leu Ala Ser Gly Leu Ile Gly Pro Leu Leu Ile Cys Tyr Lys Glu | 565 | 570 | 575 |
| Ser Val Asp Gln Arg Gly Asn Gln Ile Met Ser Asp Lys Arg Asn Val | 580 | 585 | 590 |
| Ile Leu Phe Ser Val Phe Asp Glu Asn Arg Ser Trp Tyr Leu Thr Glu | 595 | 600 | 605 |
| Asn Ile Gln Arg Phe Leu Pro Asn Pro Ala Gly Val Gln Leu Glu Asp | 610 | 615 | 620 |
| Pro Glu Phe Gln Ala Ser Asn Ile Met His Ser Ile Asn Gly Tyr Val | 625 | 630 | 635 |
| Phe Asp Ser Leu Gln Leu Ser Val Cys Leu His Glu Val Ala Tyr Trp | 645 | 650 | 655 |
| Tyr Ile Leu Ser Ile Gly Ala Gln Thr Asp Phe Leu Ser Val Phe Phe | 660 | 665 | 670 |
| Ser Gly Tyr Thr Phe Lys His Lys Met Val Tyr Glu Asp Thr Leu Thr | 675 | 680 | 685 |
| Leu Phe Pro Phe Ser Gly Glu Thr Val Phe Met Ser Met Glu Asn Pro | 690 | 695 | 700 |
| Gly Leu Trp Ile Leu Gly Cys His Asn Ser Asp Phe Arg Asn Arg Gly | 705 | 710 | 715 |
| Met Thr Ala Leu Leu Lys Val Ser Ser Cys Asp Lys Asn Thr Gly Asp | 725 | 730 | 735 |
| Tyr Tyr Glu Asp Ser Tyr Glu Asp Ile Ser Ala Tyr Leu Leu Ser Lys | 740 | 745 | 750 |
| Asn Asn Ala Ile Glu Pro Arg Ser Phe Ser Gln Asn Ser Arg His Arg | 755 | 760 | 765 |
| Ser Thr Arg Gln Lys Gln Phe Asn Ala Thr Thr Ile Pro Glu Asn Asp | 770 | 775 | 780 |

Ile Glu Lys Thr Asp Pro Trp Phe Ala His Arg Thr Pro Met Pro Lys
 785 790 795 800

Ile Gln Asn Val Ser Ser Ser Asp Leu Leu Met Leu Leu Arg Gln Ser
 805 810 815

Pro Thr Pro His Gly Leu Ser Leu Ser Asp Leu Gln Glu Ala Lys Tyr
 820 825 830

Glu Thr Phe Ser Asp Asp Pro Ser Pro Gly Ala Ile Asp Ser Asn Asn
 835 840 845

Ser Leu Ser Glu Met Thr His Phe Arg Pro Gln Leu His His Ser Gly
 850 855 860

Asp Met Val Phe Thr Pro Glu Ser Gly Leu Gln Leu Arg Leu Asn Glu
 865 870 875 880

Lys Leu Gly Thr Thr Ala Ala Thr Glu Leu Lys Lys Leu Asp Phe Lys
 885 890 895

Val Ser Ser Thr Ser Asn Asn Leu Ile Ser Thr Ile Pro Ser Asp Asn
 900 905 910

Leu Ala Ala Gly Thr Asp Asn Thr Ser Ser Leu Gly Pro Pro Ser Met
 915 920 925

Pro Val His Tyr Asp Ser Gln Leu Asp Thr Thr Leu Phe Gly Lys Lys
 930 935 940

Ser Ser Pro Leu Thr Glu Ser Gly Gly Pro Leu Ser Leu Ser Glu Glu
 945 950 955 960

Asn Asn Asp Ser Lys Leu Leu Glu Ser Gly Leu Met Asn Ser Gln Glu
 965 970 975

Ser Ser Trp Gly Lys Asn Val Ser Ser Thr Glu Ser Gly Arg Leu Phe
 980 985 990

Lys Gly Lys Arg Ala His Gly Pro Ala Leu Leu Thr Lys Asp Asn Ala
 995 1000 1005

Leu Phe Lys Val Ser Ile Ser Leu Leu Lys Thr Asn Lys Thr Ser
 1010 1015 1020

Asn Asn Ser Ala Thr Asn Arg Lys Thr His Ile Asp Gly Pro Ser
 1025 1030 1035

Leu Leu Ile Glu Asn Ser Pro Ser Val Trp Gln Asn Ile Leu Glu
 1040 1045 1050

Ser Asp Thr Glu Phe Lys Lys Val Thr Pro Leu Ile His Asp Arg
 1055 1060 1065

Met Leu Met Asp Lys Asn Ala Thr Ala Leu Arg Leu Asn His Met
 1070 1075 1080

Ser Asn Lys Thr Thr Ser Ser Lys Asn Met Glu Met Val Gln Gln
 1085 1090 1095

Lys Lys Glu Gly Pro Ile Pro Pro Asp Ala Gln Asn Pro Asp Met
 1100 1105 1110

Ser Phe Phe Lys Met Leu Phe Leu Pro Glu Ser Ala Arg Trp Ile
 1115 1120 1125

Gln Arg Thr His Gly Lys Asn Ser Leu Asn Ser Gly Gln Gly Pro
 1130 1135 1140

Ser Pro Lys Gln Leu Val Ser Leu Gly Pro Glu Lys Ser Val Glu
 1145 1150 1155

Gly Gln Asn Phe Leu Ser Glu Lys Asn Lys Val Val Val Gly Lys
 1160 1165 1170

Gly Glu Phe Thr Lys Asp Val Gly Leu Lys Glu Met Val Phe Pro
 1175 1180 1185

Ser Ser Arg Asn Leu Phe Leu Thr Asn Leu Asp Asn Leu His Glu
 1190 1195 1200

Asn Asn Thr His Asn Gln Glu Lys Lys Ile Gln Glu Glu Ile Glu
 1205 1210 1215

Lys Lys Glu Thr Leu Ile Gln Glu Asn Val Val Leu Pro Gln Ile
 1220 1225 1230
 His Thr Val Thr Gly Thr Lys Asn Phe Met Lys Asn Leu Phe Leu
 1235 1240 1245
 Leu Ser Thr Arg Gln Asn Val Glu Gly Ser Tyr Asp Gly Ala Tyr
 1250 1255 1260
 Ala Pro Val Leu Gln Asp Phe Arg Ser Leu Asn Asp Ser Thr Asn
 1265 1270 1275
 Arg Thr Lys Lys His Thr Ala His Phe Ser Lys Lys Gly Glu Glu
 1280 1285 1290
 Glu Asn Leu Glu Gly Leu Gly Asn Gln Thr Lys Gln Ile Val Glu
 1295 1300 1305
 Lys Tyr Ala Cys Thr Thr Arg Ile Ser Pro Asn Thr Ser Gln Gln
 1310 1315 1320
 Asn Phe Val Thr Gln Arg Ser Lys Arg Ala Leu Lys Gln Phe Arg
 1325 1330 1335
 Leu Pro Leu Glu Glu Thr Glu Leu Glu Lys Arg Ile Ile Val Asp
 1340 1345 1350
 Asp Thr Ser Thr Gln Trp Ser Lys Asn Met Lys His Leu Thr Pro
 1355 1360 1365
 Ser Thr Leu Thr Gln Ile Asp Tyr Asn Glu Lys Glu Lys Gly Ala
 1370 1375 1380
 Ile Thr Gln Ser Pro Leu Ser Asp Cys Leu Thr Arg Ser His Ser
 1385 1390 1395
 Ile Pro Gln Ala Asn Arg Ser Pro Leu Pro Ile Ala Lys Val Ser
 1400 1405 1410
 Ser Phe Pro Ser Ile Arg Pro Ile Tyr Leu Thr Arg Val Leu Phe
 1415 1420 1425
 Gln Asp Asn Ser Ser His Leu Pro Ala Ala Ser Tyr Arg Lys Lys

| | | |
|---|------|------|
| 1430 | 1435 | 1440 |
| Asp Ser Gly Val Gln Glu Ser Ser His Phe Leu Gln Gly Ala Lys 1445 1450 1455 | | |
| Lys Asn Asn Leu Ser Leu Ala Ile Leu Thr Leu Glu Met Thr Gly 1460 1465 1470 | | |
| Asp Gln Arg Glu Val Gly Ser Leu Gly Thr Ser Ala Thr Asn Ser 1475 1480 1485 | | |
| Val Thr Tyr Lys Lys Val Glu Asn Thr Val Leu Pro Lys Pro Asp 1490 1495 1500 | | |
| Leu Pro Lys Thr Ser Gly Lys Val Glu Leu Leu Pro Lys Val His 1505 1510 1515 | | |
| Ile Tyr Gln Lys Asp Leu Phe Pro Thr Glu Thr Ser Asn Gly Ser 1520 1525 1530 | | |
| Pro Gly His Leu Asp Leu Val Glu Gly Ser Leu Leu Gln Gly Thr 1535 1540 1545 | | |
| Glu Gly Ala Ile Lys Trp Asn Glu Ala Asn Arg Pro Gly Lys Val 1550 1555 1560 | | |
| Pro Phe Leu Arg Val Ala Thr Glu Ser Ser Ala Lys Thr Pro Ser 1565 1570 1575 | | |
| Lys Leu Leu Asp Pro Leu Ala Trp Asp Asn His Tyr Gly Thr Gln 1580 1585 1590 | | |
| Ile Pro Lys Glu Glu Trp Lys Ser Gln Glu Lys Ser Pro Glu Lys 1595 1600 1605 | | |
| Thr Ala Phe Lys Lys Lys Asp Thr Ile Leu Ser Leu Asn Ala Cys 1610 1615 1620 | | |
| Glu Ser Asn His Ala Ile Ala Ala Ile Asn Glu Gly Gln Asn Lys 1625 1630 1635 | | |
| Pro Glu Ile Glu Val Thr Trp Ala Lys Gln Gly Arg Thr Glu Arg 1640 1645 1650 | | |

Leu Cys Ser Gln Asn Pro Pro Val Leu Lys Arg His Gln Arg Glu
 1655 1660 1665
 Ile Thr Arg Thr Thr Leu Gln Ser Asp Gln Glu Glu Ile Asp Tyr
 1670 1675 1680
 Asp Asp Thr Ile Ser Val Glu Met Lys Lys Glu Asp Phe Asp Ile
 1685 1690 1695
 Tyr Asp Glu Asp Glu Asn Gln Ser Pro Arg Ser Phe Gln Lys Lys
 1700 1705 1710
 Thr Arg His Tyr Phe Ile Ala Ala Val Glu Arg Leu Trp Asp Tyr
 1715 1720 1725
 Gly Met Ser Ser Ser Pro His Val Leu Arg Asn Arg Ala Gln Ser
 1730 1735 1740
 Gly Ser Val Pro Gln Phe Lys Lys Val Val Phe Gln Glu Phe Thr
 1745 1750 1755
 Asp Gly Ser Phe Thr Gln Pro Leu Tyr Arg Gly Glu Leu Asn Glu
 1760 1765 1770
 His Leu Gly Leu Leu Gly Pro Tyr Ile Arg Ala Glu Val Glu Asp
 1775 1780 1785
 Asn Ile Met Val Thr Phe Arg Asn Gln Ala Ser Arg Pro Tyr Ser
 1790 1795 1800
 Phe Tyr Ser Ser Leu Ile Ser Tyr Glu Glu Asp Gln Arg Gln Gly
 1805 1810 1815
 Ala Glu Pro Arg Lys Asn Phe Val Lys Pro Asn Glu Thr Lys Thr
 1820 1825 1830
 Tyr Phe Trp Lys Val Gln His His Met Ala Pro Thr Lys Asp Glu
 1835 1840 1845
 Phe Asp Cys Lys Ala Trp Ala Tyr Phe Ser Asp Val Asp Leu Glu
 1850 1855 1860

Lys Asp Val His Ser Gly Leu Ile Gly Pro Leu Leu Val Cys His
 1865 1870 1875
 Thr Asn Thr Leu Asn Pro Ala His Gly Arg Gln Val Thr Val Gln
 1880 1885 1890
 Glu Phe Ala Leu Phe Phe Thr Ile Phe Asp Glu Thr Lys Ser Trp
 1895 1900 1905
 Tyr Phe Thr Glu Asn Met Glu Arg Asn Cys Arg Ala Pro Cys Asn
 1910 1915 1920
 Ile Gln Met Glu Asp Pro Thr Phe Lys Glu Asn Tyr Arg Phe His
 1925 1930 1935
 Ala Ile Asn Gly Tyr Ile Met Asp Thr Leu Pro Gly Leu Val Met
 1940 1945 1950
 Ala Gln Asp Gln Arg Ile Arg Trp Tyr Leu Leu Ser Met Gly Ser
 1955 1960 1965
 Asn Glu Asn Ile His Ser Ile His Phe Ser Gly His Val Phe Thr
 1970 1975 1980
 Val Arg Lys Lys Glu Glu Tyr Lys Met Ala Leu Tyr Asn Leu Tyr
 1985 1990 1995
 Pro Gly Val Phe Glu Thr Val Glu Met Leu Pro Ser Lys Ala Gly
 2000 2005 2010
 Ile Trp Arg Val Glu Cys Leu Ile Gly Glu His Leu His Ala Gly
 2015 2020 2025
 Met Ser Thr Leu Phe Leu Val Tyr Ser Asn Lys Cys Gln Thr Pro
 2030 2035 2040
 Leu Gly Met Ala Ser Gly His Ile Arg Asp Phe Gln Ile Thr Ala
 2045 2050 2055
 Ser Gly Gln Tyr Gly Gln Trp Ala Pro Lys Leu Ala Arg Leu His
 2060 2065 2070

Tyr Ser Gly Ser Ile Asn Ala Trp Ser Thr Lys Glu Pro Phe Ser
 2075 2080 2085

Trp Ile Lys Val Asp Leu Leu Ala Pro Met Ile Ile His Gly Ile
 2090 2095 2100

Lys Thr Gln Gly Ala Arg Gln Lys Phe Ser Ser Leu Tyr Ile Ser
 2105 2110 2115

Gln Phe Ile Ile Met Tyr Ser Leu Asp Gly Lys Lys Trp Gln Thr
 2120 2125 2130

Tyr Arg Gly Asn Ser Thr Gly Thr Leu Met Val Phe Phe Gly Asn
 2135 2140 2145

Val Asp Ser Ser Gly Ile Lys His Asn Ile Phe Asn Pro Pro Ile
 2150 2155 2160

Ile Ala Arg Tyr Ile Arg Leu His Pro Thr His Tyr Ser Ile Arg
 2165 2170 2175

Ser Thr Leu Arg Met Glu Leu Met Gly Cys Asp Leu Asn Ser Cys
 2180 2185 2190

Ser Met Pro Leu Gly Met Glu Ser Lys Ala Ile Ser Asp Ala Gln
 2195 2200 2205

Ile Thr Ala Ser Ser Tyr Phe Thr Asn Met Phe Ala Thr Trp Ser
 2210 2215 2220

Pro Ser Lys Ala Arg Leu His Leu Gln Gly Arg Ser Asn Ala Trp
 2225 2230 2235

Arg Pro Gln Val Asn Asn Pro Lys Glu Trp Leu Gln Val Asp Phe
 2240 2245 2250

Gln Lys Thr Met Lys Val Thr Gly Val Thr Thr Gln Gly Val Lys
 2255 2260 2265

Ser Leu Leu Thr Ser Met Tyr Val Lys Glu Phe Leu Ile Ser Ser
 2270 2275 2280

Ser Gln Asp Gly His Gln Trp Thr Leu Phe Phe Gln Asn Gly Lys

2285 2290 2295

Val Lys Val Phe Gln Gly Asn Gln Asp Ser Phe Thr Pro Val Val
2300 2305 2310

Asn Ser Leu Asp Pro Pro Leu Leu Thr Arg Tyr Leu Arg Ile His
2315 2320 2325

Pro Gln Ser Trp Val His Gln Ile Ala Leu Arg Met Glu Val Leu
2330 2335 2340

Gly Cys Glu Ala Gln Asp Leu Tyr
2345 2350

<210> 31
<211> 1471
<212> DNA
<213> Homo sapiens

<400> 31
atggcgcccg tcgcgcgtctg ggccgcgcgtg gccgtcggac tggagctctg ggctgcggcg 60
cacgccttgc ccgccacggt gccatttaca ccctaogccc oggagccccc gagcacatgc 120
cggctcagag aatactatga ccagacagct cagatgtgct gcagcaaatg ctgcgcgggc 180
caacatgcaa aagtcttctg taccaagacc toggacaccc tgtgtgactc ctgtgaggac 240
agcacatata ccagctctg gaactgggtt ccgagtgct ttagctgtgg ctcccgcgtg 300
agctctgacc aggtggaaac tcaagcctgc actcgggaac agaaccgcat ctgcacctgc 360
aggcccggtt ggtactgcgc gctgagcaag caggaggggt gccggtgtg cgcgcgcgtg 420
cgcaagtgc gccccgggtt cggcgtggcc agaccaggaa ctgaaacatc agacgtgtgtg 480
tgcaagccct gtgcgccggg gaogttctcc aacacgaact catccacgga tatttgcaag 540
ccccaccaga tctgtaacct ggtggccatc cctgggaatg caagcatgga tgcagtctgc 600
acgtccactg ccccccaccc gagtatggcc ccaggggcag tacacttacc ccagccagtg 660
tccacacgat cccaacacac gcagccaact ccagaaccca gcaactgctcc aagcacctcc 720
ttctctctcc caatggggcc cagcccccga gctgaaggga gcaactggcga cttcgcctctt 780
ccagttggac tgatttggg tgtgacagcc ttgggtctac taataatagg agtggtgaa 840
tgtgtcatca tgaccaggt gaaaaagaag cccttgtgccc tgcagagaga agccaaggtg 900
cctcacttgc ctgcgcgataa ggcccggggt acacagggcc ccgagcagca gcacctgctg 960

atcacagcgc cgagctccag cagcagctcc ctggagagct cggccagtgc gttggacaga 1020
 agggcgccca ctcggaacca gccacaggca ccaggcgtgg aggccagtgg ggcgggggag 1080
 gcccgggcca gcaccgggag ctcatattct tcccctgggt gccatgggac ccaggatcaat 1140
 gtcacctgca tcgtgaacgt ctgtagcagc tctgaccaca gctcacagtg ctctcccaa 1200
 gccagctcca caatgggaga cacagattcc agccctcgg agtcccgaag gacgagcag 1260
 gtcccttctt ccaaggagga atgtgccttt cggtcacagc tggagacgcc agagaccctg 1320
 ctggggagca ccgaagagaa gcccctgccc ctggagtgcc ctgatgctgg gatgaagccc 1380
 agttaaccag gccggtgtgg gctgtgtcgt agccaagggt ggctgagccc tggcaggatg 1440
 accctgcgaa ggggccctgg tccttcagg c 1471

<210> 32
 <211> 461
 <212> FRT
 <213> Homo sapiens

<400> 32

Met Ala Pro Val Ala Val Trp Ala Ala Leu Ala Val Gly Leu Glu Leu
 1 5 10 15

Trp Ala Ala Ala His Ala Leu Pro Ala Gln Val Ala Phe Thr Pro Tyr
 20 25 30

Ala Pro Glu Pro Gly Ser Thr Cys Arg Leu Arg Glu Tyr Tyr Asp Gln
 35 40 45

Thr Ala Gln Met Cys Cys Ser Lys Cys Ser Pro Gly Gln His Ala Lys
 50 55 60

Val Phe Cys Thr Lys Thr Ser Asp Thr Val Cys Asp Ser Cys Glu Asp
 65 70 75 80

Ser Thr Tyr Thr Gln Leu Trp Asn Trp Val Pro Glu Cys Leu Ser Cys
 85 90 95

Gly Ser Arg Cys Ser Ser Asp Gln Val Glu Thr Gln Ala Cys Thr Arg
 100 105 110

Glu Gln Asn Arg Ile Cys Thr Cys Arg Pro Gly Trp Tyr Cys Ala Leu
 115 120 125

Ser Lys Gln Glu Gly Cys Arg Leu Cys Ala Pro Leu Arg Lys Cys Arg
 130 135 140

Pro Gly Phe Gly Val Ala Arg Pro Gly Thr Glu Thr Ser Asp Val Val
 145 150 155 160

Cys Lys Pro Cys Ala Pro Gly Thr Phe Ser Asn Thr Thr Ser Ser Thr
 165 170 175

Asp Ile Cys Arg Pro His Gln Ile Cys Asn Val Val Ala Ile Pro Gly
 180 185 190

Asn Ala Ser Met Asp Ala Val Cys Thr Ser Thr Ser Pro Thr Arg Ser
 195 200 205

Met Ala Pro Gly Ala Val His Leu Pro Gln Pro Val Ser Thr Arg Ser
 210 215 220

Gln His Thr Gln Pro Thr Pro Glu Pro Ser Thr Ala Pro Ser Thr Ser
 225 230 235 240

Phe Leu Leu Pro Met Gly Pro Ser Pro Pro Ala Glu Gly Ser Thr Gly
 245 250 255

Asp Phe Ala Leu Pro Val Gly Leu Ile Val Gly Val Thr Ala Leu Gly
 260 265 270

Leu Leu Ile Ile Gly Val Val Asn Cys Val Ile Met Thr Gln Val Lys
 275 280 285

Lys Lys Pro Leu Cys Leu Gln Arg Glu Ala Lys Val Pro His Leu Pro
 290 295 300

Ala Asp Lys Ala Arg Gly Thr Gln Gly Pro Glu Gln Gln His Leu Leu
 305 310 315 320

Ile Thr Ala Pro Ser Ser Ser Ser Ser Ser Leu Glu Ser Ser Ala Ser
 325 330 335

Ala Leu Asp Arg Arg Ala Pro Thr Arg Asn Gln Pro Gln Ala Pro Gly
 340 345 350

Val Glu Ala Ser Gly Ala Gly Glu Ala Arg Ala Ser Thr Gly Ser Ser
355 360 365

Asp Ser Ser Pro Gly Gly His Gly Thr Gln Val Asn Val Thr Cys Ile
370 375 380

Val Asn Val Cys Ser Ser Ser Asp His Ser Ser Gln Cys Ser Ser Gln
385 390 395 400

Ala Ser Ser Thr Met Gly Asp Thr Asp Ser Ser Pro Ser Glu Ser Pro
405 410 415

Lys Asp Glu Gln Val Pro Phe Ser Lys Glu Glu Cys Ala Phe Arg Ser
420 425 430

Gln Leu Glu Thr Pro Glu Thr Leu Leu Gly Ser Thr Glu Glu Lys Pro
435 440 445

Leu Pro Leu Gly Val Pro Asp Ala Gly Met Lys Pro Ser
450 455 460

<210> 33
<211> 1475
<212> DNA
<213> Homo sapiens

<400> 33
tccacctgtc ccgcagcgc cggtctcgcc cctcctgccg cagccaccga gccgccgtct 60
agggcccccga cctcgccacc atgagagccc tgctggcgcc cctgcttctc tgcgtcctgg 120
tcgtgagcga ctccaaaggc agcaatgaac ttcataagtt tccatcgaac tgtgactgtc 180
taaattggagg aacatgtgtg tccaaacaagt acttctccaa cattcactgg tgcaactgcc 240
caagaaatt cggaggggcag cactgtgaaa tagataagtc aaaaacctgc tatgagggga 300
atggtcactt ttaccgagga aaggccagca ctgacacatt gggcgggccc tgccctgccct 360
ggaactctgc cactgtcctt cagcaaactg accatgccca cagatctgat gctcttcagc 420
tggtcctggg gaaacataat tactgcagga acccagacaa ccggaggcga ccctgggtgt 480
atgtgcaggt gggcctaaag ccgcttgtcc aagagtgcatt ggtgcattgac tgcgcagatg 540
gaaaaaagcc ctctctcct ccagaagaat taaaatttca gtgtggccaa aagactctga 600
ggccccgctt taagattatt gggggagaat tcaccacatt cgagaaccag ccctgggttg 660
cgcccatcta caggaggcac cgggggggct ctgtcaccta cgtgtgtgga ggcagcctca 720

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tcagcccttg ctgggtgac agcgccacac actgcttcat tgattacca aagaaggagg      780
actacatcgt ctacctgggt cgctcaaggc ttaactcaa caccgaagg gagatgaagt      840
ttgaggtgga aaacctatc ctacacaagg actacagcgc tgacaogctt gctcaccaca      900
acgacattgc cttgctgaag atccgttcca aggagggcag gtgtgcgcag ccatcccgga      960
ctatacagac catctgcctg ccctcgatgt ataacgatcc ccagtttggc acaagctgtg     1020
agatcactgg ctttggaata gagaattcta ccgactatct ctatccggag cagctgaaga     1080
tgactgttgt gaagctgatt tcccaccggg agtgtcagca gcccactac tacggctctg     1140
aagtcaccac caaaatgctg tgtgtgctg acccacagt gaaaacagat tcctgccagg     1200
gagactcagg gggaccctc gtctgttccc tccaaggccg catgactttg actggaattg     1260
tgagctgggg ccgtggatgt gccctgaagg acaagccagg cgtctacacg agagtctcac     1320
acttcttacc ctggatccgc agtcacacca aggaagagaa tggcctggcc ctctgagggg     1380
ccccagggag gaaacgggca ccaccgctt tcttgctggg tgtcattttt gcagtagagt     1440
catctccatc agctgtaaga agagactggg aagat                                  1475

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<210> 34
<211> 431
<212> PRT
<213> Homo sapiens

```

```

<400> 34

```

```

Met Arg Ala Leu Leu Ala Arg Leu Leu Leu Cys Val Leu Val Val Ser
1           5           10           15

```

```

Asp Ser Lys Gly Ser Asn Glu Leu His Gln Val Pro Ser Asn Cys Asp
          20           25           30

```

```

Cys Leu Asn Gly Gly Thr Cys Val Ser Asn Lys Tyr Phe Ser Asn Ile
          35           40           45

```

```

His Trp Cys Asn Cys Pro Lys Lys Phe Gly Gly Gln His Cys Glu Ile
          50           55           60

```

```

Asp Lys Ser Lys Thr Cys Tyr Glu Gly Asn Gly His Phe Tyr Arg Gly
65           70           75           80

```

```

Lys Ala Ser Thr Asp Thr Met Gly Arg Pro Cys Leu Pro Trp Asn Ser
          85           90           95

```

Ala Thr Val Leu Gln Gln Thr Tyr His Ala His Arg Ser Asp Ala Leu
100 105 110

Gln Leu Gly Leu Gly Lys His Asn Tyr Cys Arg Asn Pro Asp Asn Arg
115 120 125

Arg Arg Pro Trp Cys Tyr Val Gln Val Gly Leu Lys Pro Leu Val Gln
130 135 140

Glu Cys Met Val His Asp Cys Ala Asp Gly Lys Lys Pro Ser Ser Pro
145 150 155 160

Pro Glu Glu Leu Lys Phe Gln Cys Gly Gln Lys Thr Leu Arg Pro Arg
165 170 175

Phe Lys Ile Ile Gly Gly Glu Phe Thr Thr Ile Glu Asn Gln Pro Trp
180 185 190

Phe Ala Ala Ile Tyr Arg Arg His Arg Gly Gly Ser Val Thr Tyr Val
195 200 205

Cys Gly Gly Ser Leu Ile Ser Pro Cys Trp Val Ile Ser Ala Thr His
210 215 220

Cys Phe Ile Asp Tyr Pro Lys Lys Glu Asp Tyr Ile Val Tyr Leu Gly
225 230 235 240

Arg Ser Arg Leu Asn Ser Asn Thr Gln Gly Glu Met Lys Phe Glu Val
245 250 255

Glu Asn Leu Ile Leu His Lys Asp Tyr Ser Ala Asp Thr Leu Ala His
260 265 270

His Asn Asp Ile Ala Leu Leu Lys Ile Arg Ser Lys Glu Gly Arg Cys
275 280 285

Ala Gln Pro Ser Arg Thr Ile Gln Thr Ile Cys Leu Pro Ser Met Tyr
290 295 300

Asn Asp Pro Gln Phe Gly Thr Ser Cys Glu Ile Thr Gly Phe Gly Lys
305 310 315 320

Glu Asn Ser Thr Asp Tyr Leu Tyr Pro Glu Gln Leu Lys Met Thr Val
 325 330 335

Val Lys Leu Ile Ser His Arg Glu Cys Gln Gln Pro His Tyr Tyr Gly
 340 345 350

Ser Glu Val Thr Thr Lys Met Leu Cys Ala Ala Asp Pro Gln Trp Lys
 355 360 365

Thr Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro Leu Val Cys Ser Leu
 370 375 380

Gln Gly Arg Met Thr Leu Thr Gly Ile Val Ser Trp Gly Arg Gly Cys
 385 390 395 400

Ala Leu Lys Asp Lys Pro Gly Val Tyr Thr Arg Val Ser His Phe Leu
 405 410 415

Pro Trp Ile Arg Ser His Thr Lys Glu Glu Asn Gly Leu Ala Leu
 420 425 430

<210> 35

<211> 107

<212> PRT

<213> Mus musculus

<400> 35

Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
 1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Asp Val Asn Thr Ala
 20 25 30

Val Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
 35 40 45

Tyr Ser Ala Ser Phe Leu Tyr Ser Gly Val Pro Ser Arg Phe Ser Gly
 50 55 60

Ser Arg Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
 65 70 75 80

Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln His Tyr Thr Thr Pro Pro

85

90

95

Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
100 105

<210> 36
<211> 120
<212> PRT
<213> Mus musculus

<400> 36

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Asn Ile Lys Asp Thr
20 25 30

Tyr Ile His Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ala Arg Ile Tyr Pro Thr Asn Gly Tyr Thr Arg Tyr Ala Asp Ser Val
50 55 60

Lys Gly Arg Phe Thr Ile Ser Ala Asp Thr Ser Lys Asn Thr Ala Tyr
65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95

Ser Arg Trp Gly Gly Asp Gly Phe Tyr Ala Met Asp Tyr Trp Gly Gln
100 105 110

Gly Thr Leu Val Thr Val Ser Ser
115 120

<210> 37
<211> 120
<212> PRT
<213> Mus musculus

<400> 37

Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
1 5 10 15

Thr Leu Thr Thr Cys Thr Phe Ser Gly Phe Ser Leu Ser Thr Ser
 20 25 30

Gly Met Ser Val Gly Trp Ile Arg Gln Pro Ser Gly Lys Ala Leu Glu
 35 40 45

Trp Leu Ala Asp Ile Trp Trp Asp Asp Lys Lys Asp Tyr Asn Pro Ser
 50 55 60

Leu Lys Ser Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val
 65 70 75 80

Val Leu Lys Val Thr Asn Met Asp Pro Ala Asp Thr Ala Thr Tyr Tyr
 85 90 95

Cys Ala Arg Ser Met Ile Thr Asn Trp Tyr Phe Asp Val Trp Gly Ala
 100 105 110

Gly Thr Thr Val Thr Val Ser Ser
 115 120

<210> 38

<211> 106

<212> PRT

<213> Mus musculus

<400> 38

Asp Ile Gln Met Thr Gln Ser Pro Ser Thr Leu Ser Ala Ser Val Gly
 1 5 10 15

Asp Arg Val Thr Ile Thr Cys Lys Cys Gln Leu Ser Val Gly Tyr Met
 20 25 30

His Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Trp Ile Tyr
 35 40 45

Asp Thr Ser Lys Leu Ala Ser Gly Val Pro Ser Arg Phe Ser Gly Ser
 50 55 60

Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro Asp
 65 70 75 80

Asp Phe Ala Thr Tyr Tyr Cys Phe Gln Gly Ser Gly Tyr Pro Phe Thr
 85 90 95

Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
100 105

<210> 39
<211> 1039
<212> DNA
<213> Homo sapiens

<400> 39
tctgtcacag gcagtgacct gaagtgtctt ttcagagacc tttcttcata gactactttt 60
ttttctttaa gcagcaaaag gagaaaattg tcatcaaagg atattccaga ttcttgacag 120
cattctcgtc atctctgagg acatcaccaat catctcagga tgaggggcat gaagctgctg 180
ggggcgctgc tggcactggc gggccctactg cagggggcgg tgtccctgaa gatcgcagcc 240
ttcaacatcc agacatttgg ggagaccaag atgtccaatg ccacctcgt cagctacatt 300
gtgcagatcc tgagccgcta tgacatogcc ctgggtccagg aggtcagaga cagccacctg 360
actgcctggt ggaagctgct ggacaacctc aatcaggatg caccagacac ctatcactac 420
gtggtcagtg agccactggg acggaacagc tataaggagc gctacctgtt cgtgtacagg 480
cctgaccagg tgtctgoggt ggacagctac tactacgatg atggctgoga gccctgcggg 540
aacgacacct tcaacogaga gccagccatt gtcaggttct tctccgggt caccagaggtc 600
agggagtttg ccattgttcc cctgcatgag gcccggggg acgcagtagc cgagatcgac 660
gctctctatg acgtctacct ggatgtccaa gagaatggg gcttgaggga cgtcatgttg 720
atgggcgact tcaatgcggg ctgcagctat gtgagacctc ccagtggtc atccatccgc 780
ctgtggacaa gcccaccett ccagtggctg atccccgaca gcgtgacac cacagctaca 840
cccacgcact gtgcctatga caggatcggt gttgcaggga tgctgctcg aggcgcggtt 900
gttcccgact oggctcttcc cttaacttc caggctgcct atggcctgag tgaccaactg 960
gcccagcca tcagtacaa ctatccagtg gaggtgatgc tgaagtgage agcccctccc 1020
cacaccagtt gaactgcag 1039

<210> 40
<211> 282
<212> PRT
<213> Homo sapiens

<400> 40

Met Arg Gly Met Lys Leu Leu Gly Ala Leu Leu Ala Leu Ala Ala Leu

| | | | |
|---|-----|-----|-----|
| 1 | 5 | 10 | 15 |
| Leu Gln Gly Ala Val Ser Leu Lys Ile Ala Ala Phe Asn Ile Gln Thr | 20 | 25 | 30 |
| Phe Gly Glu Thr Lys Met Ser Asn Ala Thr Leu Val Ser Tyr Ile Val | 35 | 40 | 45 |
| Gln Ile Leu Ser Arg Tyr Asp Ile Ala Leu Val Gln Glu Val Arg Asp | 50 | 55 | 60 |
| Ser His Leu Thr Ala Val Gly Lys Leu Leu Asp Asn Leu Asn Gln Asp | 65 | 70 | 75 |
| Ala Pro Asp Thr Tyr His Tyr Val Val Ser Glu Pro Leu Gly Arg Asn | 85 | 90 | 95 |
| Ser Tyr Lys Glu Arg Tyr Leu Phe Val Tyr Arg Pro Asp Gln Val Ser | 100 | 105 | 110 |
| Ala Val Asp Ser Tyr Tyr Tyr Asp Asp Gly Cys Glu Pro Cys Gly Asn | 115 | 120 | 125 |
| Asp Thr Phe Asn Arg Glu Pro Ala Ile Val Arg Phe Phe Ser Arg Phe | 130 | 135 | 140 |
| Thr Glu Val Arg Glu Phe Ala Ile Val Pro Leu His Ala Ala Pro Gly | 145 | 150 | 155 |
| Asp Ala Val Ala Glu Ile Asp Ala Leu Tyr Asp Val Tyr Leu Asp Val | 165 | 170 | 175 |
| Gln Glu Lys Trp Gly Leu Glu Asp Val Met Leu Met Gly Asp Phe Asn | 180 | 185 | 190 |
| Ala Gly Cys Ser Tyr Val Arg Pro Ser Gln Trp Ser Ser Ile Arg Leu | 195 | 200 | 205 |
| Trp Thr Ser Pro Thr Phe Gln Trp Leu Ile Pro Asp Ser Ala Asp Thr | 210 | 215 | 220 |
| Thr Ala Thr Pro Thr His Cys Ala Tyr Asp Arg Ile Val Val Ala Gly | 225 | 230 | 235 |
| | | | 240 |

Met Leu Leu Arg Gly Ala Val Val Pro Asp Ser Ala Leu Pro Phe Asn
 245 250 255

Phe Gln Ala Ala Tyr Gly Leu Ser Asp Gln Leu Ala Gln Ala Ile Ser
 260 265 270

Asp His Tyr Pro Val Glu Val Met Leu Lys
 275 280

<210> 41
 <211> 678
 <212> DNA
 <213> Mus musculus

<400> 41
 gacatcttgc tgactcagtc tccagccatc ctgtctgtga gtccaggaga aagagtcagt 60
 ttctcctgca gggccagtc gttcgttggc tcaagcatcc actggtatca gcaaagaaca 120
 aatggttctc caaggtctct cataaagtat gcttctgagt ctatgtctgg gatcccttc 180
 aggttttagtg gcagtggtac agggacagat ttactctta gcataaacac tgtggagtc 240
 gaagatatgg cagattatta ctgtcaacaa agtcatagct ggccattcac gttcggctcg 300
 gggacaaatt tggaagtaaa agaagtgaag ctgaggagct ctggaggagg cttggtgc 360
 cctggaggat ccatgaaact ctctgtgtt gcctctggat tcattttcag taaccactgg 420
 atgaactggg tccgccagtc tccagagaag ggccttgagt gggttgctga aattagatca 480
 aaatctatta attctgcaac acattatgag gactctgtga aaggagggtt caccatctca 540
 agagatgatt ccaaaagtc tgctacctg caaatgaccg acttaagaac tgaagacact 600
 ggcgtttatt actgttccag gaattactac ggtagtacct acgactactg gggccaaggc 660
 accactctca cagtctcc 678

<210> 42
 <211> 226
 <212> PRT
 <213> Mus musculus

<400> 42

Asp Ile Leu Leu Thr Gln Ser Pro Ala Ile Leu Ser Val Ser Pro Gly
 1 5 10 15

Glu Arg Val Ser Phe Ser Cys Arg Ala Ser Gln Phe Val Gly Ser Ser

| | | |
|--|----|----|
| 20 | 25 | 30 |
| Ile His Trp Tyr Gln Gln Arg Thr Asn Gly Ser Pro Arg Leu Leu Ile 35 40 45 | | |
| Lys Tyr Ala Ser Glu Ser Met Ser Gly Ile Pro Ser Arg Phe Ser Gly 50 55 60 | | |
| Ser Gly Ser Gly Thr Asp Phe Thr Leu Ser Ile Asn Thr Val Glu Ser 65 70 75 80 | | |
| Glu Asp Ile Ala Asp Tyr Tyr Cys Gln Gln Ser His Ser Trp Pro Phe 85 90 95 | | |
| Thr Phe Gly Ser Gly Thr Asn Leu Glu Val Lys Glu Val Lys Leu Glu 100 105 110 | | |
| Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly Ser Met Lys Leu Ser 115 120 125 | | |
| Cys Val Ala Ser Gly Phe Ile Phe Ser Asn His Trp Met Asn Trp Val 130 135 140 | | |
| Arg Gln Ser Pro Glu Lys Gly Leu Glu Trp Val Ala Glu Ile Arg Ser 145 150 155 160 | | |
| Lys Ser Ile Asn Ser Ala Thr His Tyr Ala Glu Ser Val Lys Gly Arg 165 170 175 | | |
| Phe Thr Ile Ser Arg Asp Asp Ser Lys Ser Ala Val Tyr Leu Gln Met 180 185 190 | | |
| Thr Asp Leu Arg Thr Glu Asp Thr Gly Val Tyr Tyr Cys Ser Arg Asn 195 200 205 | | |
| Tyr Tyr Gly Ser Thr Tyr Asp Tyr Trp Gly Gln Gly Thr Thr Leu Thr 210 215 220 | | |
| Val Ser 225 | | |
| <210> 43 | | |
| <211> 450 | | |

<212> DNA

<213> Homo sapiens

```

<400> 43
gctgcatcag aagaggccat caagcacatc actgtccttc tgccatggcc ctgtggatgc      60
gectcctgcc cctgctggcg ctgctggccc tctggggacc tgaccagcc gcagcctttg      120
tgaaccaaca cctgtggggc tcacacctgg tggaaagtct ctacctagtg tgcgggggaa      180
gaggtcttct ctacacaccc aagaccggcc gggaggcaga ggacctgcag gtgggggcagg      240
tggagctggg cggggggccct ggtgcaggca gctgcagcc cttggccctg gagggggtccc      300
tgcagaagcg tggcattgtg gaacaatgct gtaccagcat ctgctccctc taccagctgg      360
agaactactg caactagacg cagcccgag gcagccccc acccgccgcc tctgcaccg      420
agagagatgg aataaagccc ttgaaccagg      450

```

<210> 44

<211> 110

<212> PRT

<213> Homo sapiens

<400> 44

```

Met Ala Leu Trp Met Arg Leu Leu Pro Leu Leu Ala Leu Leu Ala Leu
1           5           10          15

```

```

Trp Gly Pro Asp Pro Ala Ala Ala Phe Val Asn Gln His Leu Cys Gly
20          25          30

```

```

Ser His Leu Val Glu Ala Leu Tyr Leu Val Cys Gly Glu Arg Gly Phe
35          40          45

```

```

Phe Tyr Thr Pro Lys Thr Arg Arg Glu Ala Glu Asp Leu Gln Val Gly
50          55          60

```

```

Gln Val Glu Leu Gly Gly Gly Pro Gly Ala Gly Ser Leu Gln Pro Leu
65          70          75          80

```

```

Ala Leu Glu Gly Ser Leu Gln Lys Arg Gly Ile Val Glu Gln Cys Cys
85          90          95

```

```

Thr Ser Ile Cys Ser Leu Tyr Gln Leu Glu Asn Tyr Cys Asn
100         105         110

```

<210> 45

<211> 1203

<212> DNA

<213> Hepatitis B virus

<400> 45

```

atggggaggtt ggtcttccaa acctcgacaa ggcattggga cgaatcttctc tgttcccaat      60
cctctgggat tctttccga tcaccagttg gacctgcgtc tcggagccaa ctcaacaat      120
ccagattggg aottcaacc caacaaggat cactggccag aggcaatcaa ggtaggagcg      180
ggagacttcg ggcagggtt cccccacca caggcggtc tttggggtg gagccctcag      240
gctcaggga tattgacaac agtgccagc gcgcctctc ctgtttccac caatcggcag      300
tcaggaagac agcctactcc catctctcca cctctaagag acagtcaccc tcaggccatg      360
cagtggaact ccacaacatt ccaccaagct ctgctagatc ccagagtgcg gggcctatat      420
tttctctctg gtggctccag ttccggaaca gtaaaccctg ttccgactac tgtctcacc      480
atatctgcaa tcttctcgag gactggggac cctgcaccga acatggagag cacaacatca      540
ggattcttag gacctctgct cgtgttacag gcggggtttt tctgttgac aagaatctc      600
acaataccac agagtctaga ctctgttggt acttctctca atttcttagg gggagcacc      660
acgtgtctct gccaaaattc gcagtcacca acctccaac actcaccaac ctcttgtct      720
ccaatttgct ctggttatcg ctggatgtgt ctgcgggctt ttatcatatt cctcttcac      780
ctgctgctat gctcatctt ctgttggtt cttctggact accaaggatg gttgcccgtt      840
tgtctctac ttccaggaac atcaactacc agcacgggac catgcaagac ctgcacgatt      900
cctgctcaag gaacctctat gtttccctct tgttctgta caaaaccttc ggacggaaac      960
tgcaattgta ttcccatccc atcatctgg gctttcgcaa gattcctatg ggagtgggcc      1020
tcagtcgctt tctctggct cagtttacta gtgccatttg ttcagtgggt cgcagggtt      1080
tcccactcg tttggcttct agttatatgg atgatgtggt attgggggcc aagtctgtac      1140
aacatcttga gtcccttttt acctctatta ccaattttct tttgtctttg ggtatacat      1200
tga                                                                                   1203

```

<210> 46

<211> 400

<212> PRT

<213> Hepatitis B virus

<400> 46

```

Met Gly Gly Trp Ser Ser Lys Pro Arg Gln Gly Met Gly Thr Asn Leu
1           5           10          15

```

Ser Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro
 20 25 30

Ala Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Asn
 35 40 45

Lys Asp His Trp Pro Glu Ala Ile Lys Val Gly Ala Gly Asp Phe Gly
 50 55 60

Pro Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln
 65 70 75 80

Ala Gln Gly Ile Leu Thr Thr Val Pro Ala Ala Pro Pro Pro Val Ser
 85 90 95

Thr Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu
 100 105 110

Arg Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His
 115 120 125

Gln Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly
 130 135 140

Gly Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Val Ser Pro
 145 150 155 160

Ile Ser Ser Ile Phe Ser Arg Thr Gly Asp Pro Ala Pro Asn Met Glu
 165 170 175

Ser Thr Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly
 180 185 190

Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser
 195 200 205

Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Ala Pro Thr Cys Pro Gly
 210 215 220

Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro
 225 230 235 240

Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile
245 250 255

Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu
260 265 270

Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser
275 280 285

Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly
290 295 300

Thr Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn
305 310 315 320

Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu
325 330 335

Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro
340 345 350

Phe Val Gln Trp Phe Ala Gly Leu Ser Pro Thr Val Trp Leu Ser Val
355 360 365

Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Asn Ile Leu Ser
370 375 380

Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile
385 390 395 400

<210> 47

<211> 799

<212> DNA

<213> Homo sapiens

<400> 47

| | |
|--|-----|
| cgaccactc agggctctgt ggacagctca cctagctgca atggctacag gctcccgga | 60 |
| gtccctgtct ctgggttttt gctgtctctg cctgcctctg ctccaagagg gcagtgcctt | 120 |
| cccaaccatt cccttatcca gcccttttga caacgctatg ctccggcccc atcgtctgca | 180 |
| ccagctggcc tttagacacct accaggagtt tgaagaagcc tatatcccaa aggaacagaa | 240 |
| gtattcatte ctgcagaacc ccagacctc cctctgtttc tcagagtcta ttccgacacc | 300 |

```

ctccaacagg gaggaaacac aacagaaatc caacctagag ctgctccgca tctccctgct 360
gctcatccag tcgtggctgg agcccgctga gttcctcagg agtgtcttcg ccaacagcct 420
ggtgtacggc gctctcgaca gcaacgtcta tgacctccta aaggacctag aggaaggcat 480
ccaaacgctg atggggaggc tggaagatgg cagccccggg actgggcaga tcttcaagca 540
gacctacagc aagttcgaca caaactcaca caacgatgac gcactactca agaactacgg 600
gctgctctac tgcttcagga aggacatgga caaggtcgag acattcctgc gcatcgtgca 660
gtgcgcgtct gtggagggca gctgtggctt ctactgtccc ggggtggcatc cctgtgaccc 720
ctccccagtg cctctcctgg ccctggaagt tgccactcca gtgcccacca gccttgcctc 780
aataaaatta agttgcatc 799

```

```

<210> 48
<211> 217
<212> PRT
<213> Homo sapiens

```

```

<400> 48

```

```

Met Ala Thr Gly Ser Arg Thr Ser Leu Leu Leu Ala Phe Gly Leu Leu
1           5           10          15

```

```

Cys Leu Pro Trp Leu Gln Glu Gly Ser Ala Phe Pro Thr Ile Pro Leu
          20          25          30

```

```

Ser Arg Pro Phe Asp Asn Ala Met Leu Arg Ala His Arg Leu His Gln
          35          40          45

```

```

Leu Ala Phe Asp Thr Tyr Gln Glu Phe Glu Glu Ala Tyr Ile Pro Lys
          50          55          60

```

```

Glu Gln Lys Tyr Ser Phe Leu Gln Asn Pro Gln Thr Ser Leu Cys Phe
65          70          75          80

```

```

Ser Glu Ser Ile Pro Thr Pro Ser Asn Arg Glu Glu Thr Gln Gln Lys
          85          90          95

```

```

Ser Asn Leu Glu Leu Leu Arg Ile Ser Leu Leu Leu Ile Gln Ser Trp
          100          105          110

```

```

Leu Glu Pro Val Gln Phe Leu Arg Ser Val Phe Ala Asn Ser Leu Val
          115          120          125

```

Tyr Gly Ala Ser Asp Ser Asn Val Tyr Asp Leu Leu Lys Asp Leu Glu
 130 135 140

Glu Gly Ile Gln Thr Leu Met Gly Arg Leu Glu Asp Gly Ser Pro Arg
 145 150 155 160

Thr Gly Gln Ile Phe Lys Gln Thr Tyr Ser Lys Phe Asp Thr Asn Ser
 165 170 175

His Asn Asp Asp Ala Leu Leu Lys Asn Tyr Gly Leu Leu Tyr Cys Phe
 180 185 190

Arg Lys Asp Met Asp Lys Val Glu Thr Phe Leu Arg Ile Val Gln Cys
 195 200 205

Arg Ser Val Glu Gly Ser Cys Gly Phe
 210 215

<210> 49
 <211> 963
 <212> DNA
 <213> Homo sapiens

<400> 49
 atggagacag acacactcct gttatgggtg ctgctgctct gggttccagg ttccactggt 60
 gacgtcaggc gagggccccc gagcctgcgg ggcagggaag ogccagcccc cagccctgac 120
 gtcccgcccg agtgcttoga cctgctgggc cgccactgag tggcctgcgg gctcctgcgc 180
 acgcgcgggc cgaaacccgc cggggccagc agccctgcgc ccaggacggc gctgcagccg 240
 caggagtcgg tgggcgcggg ggcgcgcgag ggcgcgggtg acaaaactca cacatgccca 300
 ccgtgccccag cacctgaact cctgggggga ccgtcagtc tctctctccc cccaaaaccc 360
 aaggacaccc tcattgatctc ccggaccctc gaggtcacat gcgtggtggt ggacgtgagc 420
 cacgaagacc ctgaggtcaa gttcaactgg tacgtggagc gcgtggaggt gcataatgcc 480
 aagacaaaag cgcggggagga gcagtacaac agcacgtacc gtgtggtcag cgtcctcacc 540
 gtctgcaccc aggactgggt gaatggcaag gactacaagt gcaaggtctc caacaaagcc 600
 ctcccagccc ccattcgagaa aacctctctc aaagccaaag ggcagccccg agaaccacag 660
 gtgtacaccc tgcccccatc ccgggatgag ctgaccaaga accaggtcag cctgacctgc 720
 ctggtcaaaag gcttctatcc cagcgacatc gccgtggagt gggagagcaa tgggcagccg 780

```

gagaacaact acaagaccac gcctcccggtg ttggactccg acggctcctt cttctcttac      840
agcaagctca ccgtgggacaa gagcaggtgg cagcagggga acgtttcttc atgctccgtg      900
atgcatgagg ctctgcacaa cactacacg cagaagagcc tctccctgtc tcccgggaaa      960
tga                                                                    963

```

```

<210> 50
<211> 320
<212> PRT
<213> Homo sapiens

```

```

<400> 50

```

```

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro
1          5          10          15

```

```

Gly Ser Thr Gly Asp Val Arg Arg Gly Pro Arg Ser Leu Arg Gly Arg
          20          25          30

```

```

Asp Ala Pro Ala Pro Thr Pro Cys Val Pro Ala Glu Cys Phe Asp Leu
          35          40          45

```

```

Leu Val Arg His Cys Val Ala Cys Gly Leu Leu Arg Thr Pro Arg Pro
          50          55          60

```

```

Lys Pro Ala Gly Ala Ser Ser Pro Ala Pro Arg Thr Ala Leu Gln Pro
65          70          75          80

```

```

Gln Glu Ser Val Gly Ala Gly Ala Gly Glu Ala Ala Val Asp Lys Thr
          85          90          95

```

```

His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser
          100          105          110

```

```

Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg
          115          120          125

```

```

Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro
          130          135          140

```

```

Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala
          145          150          155          160

```

```

Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val

```

165

170

175

Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr
 180 185 190

Lys Cys Lys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr
 195 200 205

Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu
 210 215 220

Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys
 225 230 235 240

Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser
 245 250 255

Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp
 260 265 270

Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser
 275 280 285

Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala
 290 295 300

Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 305 310 315 320

<210> 51

<211> 107

<212> PRT

<213> Homo sapiens

<400> 51

Asp Ile Gln Met Thr Gln Thr Pro Ser Thr Leu Ser Ala Ser Val Gly
 1 5 10 15

Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp Ile Asn Asn Tyr
 20 25 30

Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
 35 40 45

Tyr Tyr Thr Ser Thr Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Asp Asp Phe Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Trp
85 90 95

Thr Phe Gly Gln Gly Thr Lys Val Glu Val Lys
100 105

<210> 52

<211> 107

<212> PRT

<213> Mus musculus

<400> 52

Asp Ile Gln Met Thr Gln Thr Thr Ser Ser Leu Ser Ala Ser Leu Gly
1 5 10 15

Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp Ile Asn Asn Tyr
20 25 30

Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Ile Val Lys Leu Leu Ile
35 40 45

Tyr Tyr Thr Ser Thr Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser Asn Leu Glu Gln
65 70 75 80

Glu Asp Ile Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Trp
85 90 95

Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
100 105

<210> 53

<211> 119

<212> PRT

<213> Homo sapiens

<400> 53

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser
 1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Ala Phe Thr Asn Tyr
 20 25 30

Leu Ile Glu Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Ile
 35 40 45

Gly Val Ile Tyr Pro Gly Ser Gly Gly Thr Asn Tyr Asn Glu Lys Phe
 50 55 60

Lys Gly Arg Val Thr Leu Thr Val Asp Glu Ser Thr Asn Thr Ala Tyr
 65 70 75 80

Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Phe Cys
 85 90 95

Ala Arg Arg Asp Gly Asn Tyr Gly Trp Phe Ala Tyr Trp Gly Gln Gly
 100 105 110

Thr Leu Val Thr Val Ser Ser
 115

<210> 54

<211> 119

<212> PRT

<213> Mus musculus

<400> 54

Gln Val Gln Leu Gln Gln Ser Gly Ala Glu Leu Val Gly Pro Gly Thr
 1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Ala Phe Thr Asn Tyr
 20 25 30

Leu Ile Glu Trp Val Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile
 35 40 45

Gly Val Ile Tyr Pro Gly Ser Gly Gly Thr Asn Tyr Asn Glu Lys Phe
 50 55 60

Lys Gly Lys Ala Thr Leu Thr Val Asp Lys Ser Ser Thr Thr Ala Tyr
65 70 75 80

Met Gln Leu Ser Ser Leu Thr Ser Asp Asp Ser Ala Val Tyr Phe Cys
85 90 95

Ala Arg Arg Asp Gly Asn Tyr Gly Trp Phe Ala Tyr Trp Gly Arg Gly
100 105 110

Thr Leu Val Thr Val Ser Ala
115

<210> 55
<211> 214
<212> PRT
<213> Homo sapiens

<400> 55

Asp Ile Gln Met Thr Gln Thr Pro Ser Thr Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp Ile Asn Asn Tyr
20 25 30

Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Tyr Thr Ser Thr Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Asp Asp Phe Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Trp
85 90 95

Thr Phe Gly Gln Gly Thr Lys Val Glu Val Lys Arg Thr Val Ala Ala
100 105 110

Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
115 120 125

Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
130 135 140

Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
 145 150 155 160

Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser
 165 170 175

Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
 180 185 190

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